

**Table 1**  
**Quarterly Residential Well Sampling Project**  
**Parker County, TX**  
**Third Quaterly Sampling Event - November/December 2012**  
**Summary of Samples Collected**

Water Well Number (WW#)	Property Owner	Sample Collection Date	Water Condition	Sample Field Identification	Accutest Laboratory Package/Sample Identification #	Comments
WW1	Rodney and Geraldine Wells	11/30/2012	Un-treated	WW1-WEL-113012	TC20872	
WW2	Michelle Perdue	11/30/2012	Un-treated	WW2-Pur-113012	TC20890	Volume for MS/MSD collected (Accutest)
WW6	Amanda M. Thompson	12/1/2012	Un-treated	WW6-Tho-120112	TC20878	
WW7	Jeff W. Merryman	11/30/2012	Un-treated	WW7-Mer-113012	TC20871	
WW10	Devyn Hayley	12/2/2012	Un-treated	WW10-Hay-120212	TC20882	Collected at tank inlet; therefore, sample for analysis at Isotech cannot be collected
WW11	Harry and Margaret Anderson	12/1/2012	Un-treated	WW11-And-120112	TC20874	
WW13	Tom Struths	12/2/2012	Un-treated	WW13-Str-120212	TC20886	
WW14A	Stephen and Carol Hurst	12/2/2012	Un-treated	WW14A-Hur-120212	TC20883	
WW15	Stephen and Carol Hurst	12/2/2012	Un-treated	WW15-Hur-120212	TC20887	
WW18	Thomas and Elizabeth Struths	12/2/2012	Un-treated	WW18-Str-120212	TC20885	Collected at tank inlet; therefore, sample for analysis at Isotech cannot be collected
WW19	Joseph and Rebecca Williams	12/1/2012	Un-treated	WW19-Wil-120112	TC20877	
WW20	Dennis Huffman	12/1/2012	Un-treated	WW20-Huf-120112 Dup-120112	TC20875 TC20873	Purged well through sprinklers at Mr. Huffman's request Duplicate collected (Accutest)
WW21	Kirk and Brenda VanNewkrik	11/30/2012	Treated	WW21-Van-113012	TC20879	
WW22	Timothy and Sheryl Simpson	12/1/2012	Un-treated	WW-22-Sim-120112	TC20876	Found spigot broken; could not connect garden hose. Used 3/8" tubing inserted into spigot opening.
WW24	Pamela Smith	11/30/2012	Un-treated	WW24-Smi-113012	TC20880	
WW25	Jeff Matthews	12/2/2012	Un-treated	WW25-Mat-120212	TC20881	
	Trip Blank	12/2/2012		TB1-1202-12	TC20889	
	Equipment Blank	12/2/2012		EB1-120212		
	Equipment Blank	12/2/2012		EB2-120212		
	Trip Blank	12/2/2012		TB2-120212	TC20888	



Reissue #1  
12/28/12

## Technical Report for

### EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW11-And

Accutest Job Number: TC20874

Sampling Date: 12/01/12


### Report to:

EarthCon Consultants  
4800 Sugar Grove Suite 420  
Stafford, TX 77477  
gfloreslovo@earthcon.com; djackson@jacksonsjoberg.com;  
mcpatton@rangeresources.com; escott@earthcon.com  
ATTN: Gabriela Floreslovo

Total number of pages in report: 27



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

  
Richard Rodriguez  
Laboratory Director

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366)  
LA (85695/04004) OK (211-035)

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Test results relate only to samples analyzed.



Gulf Coast. Inc.

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[www.accutest.com](http://www.accutest.com)

Friday, December 28, 2012

EarthCon Consultants  
4800 Sugar Grove, Suite 420  
Stafford, TX 77477  
ATTN: Gabriela Floreslovo

RE: Accutest job TC20874 Reissue

Dear Ms. Floreslovo:

The final report for job number TC20874 has been revised to add a "U" flag to the Ethane result.

I apologize for any inconvenience. Please feel free to contact me if I can be of further assistance.

Sincerely,

Elessa Sommers

Elessa Sommers  
Project Manager

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Sample Summary

EarthCon Consultants

Job No: TC20874

Quarterly Well Sampling, Parker County, Texas  
Project No: 3rd Quarter / WW11-And

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
TC20874-1	12/01/12	08:23	12/04/12	AQ	Ground Water	WW11-AND-120112



## SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** EarthCon Consultants

**Job No** TC20874

**Site:** Quarterly Well Sampling, Parker County, Texas

**Report Date** 12/12/2012 12:04:55 P

1 Sample was collected on 12/01/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20874. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### Volatiles by GCMS By Method SW846 8260B

**Matrix** AQ

**Batch ID:** VX1673

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20864-1MS, TC20864-1MSD were used as the QC samples indicated.

### Volatiles by GC By Method RSKSOP-147/175

**Matrix** AQ

**Batch ID:** GSS232

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20890-1DUP, TC20890-1MS were used as the QC samples indicated.
- Matrix Spike Recovery(s) for Ethene, Propane are outside control limits. Probable cause due to matrix interference.
- Matrix Spike Recovery(s) for Ethane, Methane are outside control limits. Outside control limits due to high level in sample relative to spike amount.
- RPD(s) for Duplicate for Butane, Isobutane, Propane are outside control limits for sample TC20890-1DUP.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used

Summary of Hits

**Job Number:** TC20874  
**Account:** EarthCon Consultants  
**Project:** Quarterly Well Sampling, Parker County, Texas  
**Collected:** 12/01/12



Lab Sample ID	Client Sample ID	Result/ Qual	MQL	SDL	Units	Method
TC20874-1	WW11-AND-120112					
Methane		0.0109	0.00050	0.00030	mg/l	RSKSOP-147/175

Sample Results

Report of Analysis



## Report of Analysis

<b>Client Sample ID:</b>	WW11-AND-120112	<b>Date Sampled:</b>	12/01/12
<b>Lab Sample ID:</b>	TC20874-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	X0087071.D	1	12/06/12	CF	n/a	n/a	VX1673
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

## Purgeable Aromatics

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2	Benzene	0.00034 U	0.0010	0.00034	mg/l	
108-88-3	Toluene	0.00033 U	0.0010	0.00033	mg/l	
100-41-4	Ethylbenzene	0.00032 U	0.0010	0.00032	mg/l	
1330-20-7	Xylene (total)	0.00087 U	0.0030	0.00087	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	106%		72-122%
17060-07-0	1,2-Dichloroethane-D4	95%		68-124%
2037-26-5	Toluene-D8	100%		80-119%
460-00-4	4-Bromofluorobenzene	96%		72-126%

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	WW11-AND-120112	<b>Date Sampled:</b>	12/01/12
<b>Lab Sample ID:</b>	TC20874-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	RSKSOP-147/175		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	SS005044.D	1	12/06/12	LT	n/a	n/a	GSS232
Run #2							

## RSK147 Special List

CAS No.	Compound	Result	MQL	SDL	Units	Q
74-82-8	Methane	0.0109	0.00050	0.00030	mg/l	
74-85-1	Ethene	0.00050 U	0.0010	0.00050	mg/l	
74-84-0	Ethane	0.00050 U	0.0010	0.00050	mg/l	
74-98-6	Propane	0.00075 U	0.0015	0.00075	mg/l	
75-28-5	Isobutane	0.00075 U	0.0015	0.00075	mg/l	
106-97-8	Butane	0.00075 U	0.0015	0.00075	mg/l	

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Misc. Forms

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### Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody
- LRC Form

10165 Harwin Dr, Ste 150 Houston, TX 77036  
TEL: 713-271-4700 FAX: 713-271-4770  
[www.accutest.com](http://www.accutest.com)

[illegible]

## TC20874: Chain of Custody

Page 1 of 4

**Accutest Job Number:** TC20874      **Client:** EARTHCO CONSULTANTS      **Project:** 3RD QTR WELL SAMPLING,PARKER COUNTY,T  
**Date / Time Received:** 12/4/2012      **Delivery Method:** Client      **Airbill #s:** \_\_\_\_\_  
**No. Coolers:** 1      **Therm ID:** IR6      **Temp Adjustment Factor:** 0.2  
**Cooler Temps (Initial/Adjusted):** #1: (2.2/2.4)

<b>Cooler Security</b>		<b>Y or N</b>		<b>Y or N</b>	
1. Custody Seals Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Cooler Temperature</b>		<b>Y or N</b>			
1. Temp criteria achieved:	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
2. Cooler temp verification:	Infrared Gun				
3. Cooler media:	Ice (bag)				
<b>Quality Control Preservation</b>		<b>Y or N</b>	<b>N/A</b>	<b>WTB</b>	<b>STB</b>
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Trip Blank listed on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
3. Samples preserved properly:	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
4. VOCs headspace free:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

<b>Sample Integrity - Documentation</b>		<b>Y or N</b>	
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Container labeling complete:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>Sample Integrity - Condition</b>		<b>Y or N</b>	
1. Sample recvd within HT:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. All containers accounted for:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Condition of sample:	Intact		
<b>Sample Integrity - Instructions</b>		<b>Y or N</b>	<b>N/A</b>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments -Received trip blank not listed on COC.

**Accutest Job Number:** TC20874

**CSR:** Elessa Sommers

**Response Date:** 12/4/2012

**Response:** Trip blank is on separate report.

5.1

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**TC20874: Chain of Custody**  
**Page 3 of 4**

## Sample Receipt Log

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**Job #:** TC20874

**Date / Time Received:** 12/4/2012 9:22:00 AM

**Initials:** CH

**Client:** EARTHCO CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	pH	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20874-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20874-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20874-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20874-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20874-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20874-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4

 5.1  
5

**TC20874: Chain of Custody**
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# Appendix A Laboratory Data Package Cover Page

TC20874 This data package consists of

- ☐ This signature page, the laboratory review checklist, and the following reportable data:
- ☐ R1 Field chain-of-custody documentation;
- ☐ R2 Sample identification cross-reference;
- ☐ R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - a) Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
  - b) dilution factors,
  - c) preparation methods,
  - d) cleanup methods, and
  - e) if required for the project, tentatively identified compounds (TICs).
- ☐ R4 Surrogate recovery data including:
  - a) Calculated recovery (%R), and
  - b) The laboratory's surrogate QC limits.
- ☐ R5 Test reports/summary forms for blank samples;
- ☐ R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - a) LCS spiking amounts,
  - b) Calculated %R for each analyte, and
  - c) The laboratory's LCS QC limits.
- ☐ R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - a) Samples associated with the MS/MSD clearly identified,
  - b) MS/MSD spiking amounts,
  - c) Concentration of each MS/MSD analyte measured in the parent and
  - d) Calculated %Rs and relative percent differences (RPDs), and
  - e) The laboratory's MS/MSD QC limits
- ☐ R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - a) The amount of analyte measured in the duplicate,
  - b) The calculated RPD, and
  - c) The laboratory's QC limits for analytical duplicates.
- ☐ R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each
- ☐ R10 Other problems or anomalies.


The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

**Release Statement:** I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Report. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld.

**Check, if applicable:** This laboratory meets an exception under 30 TAC&25.6 and was last inspection by

☐ [X] TCEQ or ☐ \_\_\_\_\_ on April 2011. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

## QA Manager

Name (Printed)	Signature	Official Title (printed)	Date
Richard Rodriguez		Laboratory Director	12/12/2012
_____	_____	_____	_____



LABORATORY REVIEW CHECKLIST: REPORTABLE DATA									
Laboratory Name:		Accutest Gulf Coast		LRC Date:		12/12/2012			
Project Name:		Quarterly Well Sampling, Parker County, Texas		Laboratory Project Number:		TC20874			
Reviewer Name:		Anita Patel		Prep Batch Number(s):		GSS232, VX1673			
# <sup>1</sup>	A <sup>2</sup>	DESCRIPTION				YES	NO	NA <sup>3</sup>	NR <sup>4</sup> ER # <sup>5</sup>
R1	OI	<b>CHAIN-OF-CUSTODY (C-O-C):</b>							
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?				X			
		Were all departures from standard conditions described in an exception report?				X			
R2	OI	<b>Sample and quality control (QC) identification</b>							
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?				X			
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?				X			
R3	OI	<b>Test reports</b>							
		Were samples prepared and analyzed within holding times?				X			
		Other than those results <MQL, were all other raw values bracketed by calibration standards?				X			
		Were calculations checked by a peer or supervisor?				X			
		Were all analyte identifications checked by a peer or supervisor?				X			
		Were sample detection limits reported for all analytes not detected?				X			
		Were all results for soil and sediment samples reported on a dry weight basis?						X	
		Were % moisture (or solids) reported for all soil and sediment samples?						X	
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?						X	
		If required for the project, are TIC's reported?						X	
R4	O	<b>Surrogate recovery data</b>							
		Were surrogates added prior to extraction?				X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?				X			
R5	OI	<b>Test reports/summary forms for blank samples</b>							
		Were appropriate type(s) of blanks analyzed?				X			
		Were blanks analyzed at the appropriate frequency?				X			
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?				X			
		Were blank concentrations <MQL?				X			
R6	OI	<b>Laboratory control samples (LCS):</b>							
		Were all COCs included in the LCS?				X			
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?				X			
		Were LCSs analyzed at required frequency?				X			
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?				X			
		Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?				X			5
		Was the LCSD RPD within QC limits?						X	
R7	OI	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>							
		Were the project/method specified analytes included in the MS and MSD?				X			
		Were MS/MSD analyzed at the appropriate frequency?				X			
		Were MS (and MSD, if applicable) %Rs within the laboratory QC Limits?					X		4
		Were the MS/MSD RPDs within laboratory QC limits?				X			
R8	OI	<b>Analytical duplicate data</b>							
		Were appropriate analytical duplicates analyzed for each matrix?				X			
		Were analytical duplicates analyzed at the appropriate frequency?				X			
		Were RPDs or relative standard deviations within the laboratory QC limits?					X		4
R9	OI	<b>Method quantitation limits (MQLs):</b>							
		Are the MQLs for each method analyte included in the laboratory data package?				X			
		Do the MQLs correspond to the concentration of the lowest non-zero calibration				X			
		Are unadjusted MQLs and DCs included in the laboratory data package?					X		2
R10	OI	<b>Other problems/anomalies</b>							
		Are all known problems/anomalies/special conditions noted in this LRC and ER?				X			
		Was applicable and available technology used to lower the SDL to minimize the				X			
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package?				X			3

Laboratory Name:		Accutest Gulf Coast	LRC Date:		12/12/2012	
Project Name:		Quarterly Well Sampling, Parker	Laboratory Project Number:		TC20874	
Reviewer # <sup>1</sup>	Name:	Anita Patel	Prep Batch Number(s):		GSS232, VX1673	
	A <sup>2</sup>	DESCRIPTION	YES	NO	NA <sup>3</sup>	NR <sup>4</sup> ER # <sup>5</sup>
S1	OI	<b>Initial calibration (ICAL)</b>				
		Were response factors and/or relative response factors for each analyte within QC limits?	X			
		Were percent RSDs or correlation coefficient criteria met?	X			
		Was the number of standards recommended in the method used for all analytes?	X			
		Were all points generated between the lowest and highest standard used to calculate the curve?	X			
		Are ICAL data available for all instruments used?	X			
		Has the initial calibration curve been verified using an appropriate second source standard?	X			
S2	OI	<b>Initial and continuing calibration verification (ICCV AND CCV) and continuing</b>				
		Was the CCV analyzed at the method-required frequency?	X			
		Were percent differences for each analyte within the method-required QC limits?	X			
		Was the ICAL curve verified for each analyte?	X			
		Was the absolute value of the analyte concentration in the inorganic CCB<MDL?			X	
S3	O	<b>Mass spectral tuning</b>				
		Was the appropriate compound for the method used for tuning?	X			
		Were ion abundance data within the method-required QC limits?	X			
S4	O	<b>Internal standards (IS)</b>				
		Were IS area counts and retention times within the method-required QC limits?	X			
S5	OI	<b>Raw data (NELAC Section 5.5.10)</b>				
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X			
		Were data associated with manual integrations flagged on the raw data?	X			
S6	O	<b>Dual column confirmation</b>				
		Did dual column confirmation results meet the method-required QC?			X	
S7	O	<b>Tentatively identified compounds (TICs):</b>				
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X	
S8	I	<b>Interference Check Sample (ICS) results</b>				
		Were percent recoveries within method QC limits?			X	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>				
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X	
S10	OI	<b>Method detection limit (MDL) studies</b>				
		Was a MDL study performed for each reported analyte?	X			
		Is the MDL either adjusted or supported by the analysis of DCSs?	X			5
S11	OI	<b>Proficiency test reports</b>				
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X			
S12	OI	<b>Standards documentation</b>				
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate source?	X			
S13	OI	<b>Compound/analyte identification procedures</b>				
		Are the procedures for compound/analyte identification documented?	X			
S14	OI	<b>Demonstration of analyst competency (DOC)</b>				
		Was DOC conducted consistent with NELAC Chapter 5?	X			
		Is documentation of the analyst's competency up-to-date and on file?	X			
S15	OI	<b>Verification/validation documentation for methods (NELAC Chapter 5)</b>				
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X			
S16	OI	<b>Laboratory standard operating procedures (SOPs)</b>				
		Are laboratory SOPs current and on file for each method performed?	X			

LABORATORY REVIEW CHECKLIST (continued): Exception Reports				
Laboratory Name:		Accutest Gulf Coast	LRC Date:	12/12/2012
Project Name:		Quarterly Well Sampling, Parker	Laboratory Project Number:	TC20874
Reviewer Name:	Anita Patel	Prep Batch Number(s):	GSS232, VX1673	
ER#	Description			
1	For reporting purposes, the MQL is defined in the report as the RL. The unadjusted MQL/RL is reported in the method blank. The SDL is defined in the report as the MDL.			
2	For reporting purposes, the method blank represents the unadjusted MQL. The DCS is on file in the laboratory and is not included in the laboratory data package.			
3	The laboratory is NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package for analytes that are listed in the Texas Fields of Accreditation.			
4	All anomalies are discussed in the case narrative.			
5	The laboratory does not perform DCS analysis for Method RSKSOP-147/175. The components reported are not listed or do not have values in the Texas TRRP PCL tables.			

1ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on

## GC/MS Volatiles

## QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** TC20874

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VX1673-MB	X0087062.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20874-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.34	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l	
108-88-3	Toluene	ND	1.0	0.33	ug/l	
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	105% 72-122%
17060-07-0	1,2-Dichloroethane-D4	95% 68-124%
2037-26-5	Toluene-D8	99% 80-119%
460-00-4	4-Bromofluorobenzene	98% 72-126%

## Blank Spike Summary

Page 1 of 1

**Job Number:** TC20874

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VX1673-BS	X0087060.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20874-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	22.2	89	68-119
100-41-4	Ethylbenzene	25	22.1	88	71-117
108-88-3	Toluene	25	22.4	90	73-119
1330-20-7	Xylene (total)	75	67.7	90	74-119

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	101%	72-122%
17060-07-0	1,2-Dichloroethane-D4	99%	68-124%
2037-26-5	Toluene-D8	101%	80-119%
460-00-4	4-Bromofluorobenzene	92%	72-126%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** TC20874

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20864-1MS	X0087064.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1MSD	X0087065.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1	X0087063.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20874-1

CAS No.	Compound	TC20864-1 ug/l	Spike Q ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	1.0 U	25	23.0	92	22.4	90	3	68-119/12
100-41-4	Ethylbenzene	1.0 U	25	22.7	91	22.4	90	1	71-117/12
108-88-3	Toluene	1.0 U	25	22.9	92	22.5	90	2	73-119/13
1330-20-7	Xylene (total)	3.0 U	75	69.8	93	68.4	91	2	74-119/13

CAS No.	Surrogate Recoveries	MS	MSD	TC20864-1	Limits
1868-53-7	Dibromofluoromethane	103%	101%	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	98%	98%	96%	68-124%
2037-26-5	Toluene-D8	100%	100%	100%	80-119%
460-00-4	4-Bromofluorobenzene	91%	92%	98%	72-126%

\* = Outside of Control Limits.

## GC Volatiles

## QC Data Summaries

---

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



## Method Blank Summary

Page 1 of 1

**Job Number:** TC20874

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS232-MB	SS005026.D	1	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20874-1

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	ND	0.50	0.30	ug/l	
74-85-1	Ethene	ND	1.0	0.50	ug/l	
74-84-0	Ethane	ND	1.0	0.50	ug/l	
74-98-6	Propane	ND	1.5	0.75	ug/l	
75-28-5	Isobutane	ND	1.5	0.75	ug/l	
106-97-8	Butane	ND	1.5	0.75	ug/l	

## Blank Spike Summary

Page 1 of 1

**Job Number:** TC20874

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS232-BS	SS005023.D	1	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20874-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	21.5	21.0	98	68-139
74-85-1	Ethene	57.4	54.7	95	52-145
74-84-0	Ethane	43.3	56.7	131	68-131
74-98-6	Propane	60.6	68.2	113	69-131
75-28-5	Isobutane	72.5	77.3	107	72-131
106-97-8	Butane	76.6	82.4	108	66-128

\* = Outside of Control Limits.

# Matrix Spike Summary

Page 1 of 1

**Job Number:** TC20874

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20890-1MS	SS005029.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005027.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005030.D	250	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

Method: RKSOP-147/175

TC20874-1

CAS No.	Compound	TC20890-1 ug/l	Spike Q	MS ug/l	MS %	Limits
74-82-8	Methane	20100 <sup>b</sup>	21.5	17100	-13815*	68-139
74-85-1	Ethene	1.0 U	57.4	5540	9654*	52-145
74-84-0	Ethane	3500 <sup>b</sup>	43.3	4120	1431* <sup>a</sup>	68-131
74-98-6	Propane	66.8	60.6	172	174*	69-131
75-28-5	Isobutane	8.41	72.5	93.3	117	72-131
106-97-8	Butane	10.3	76.6	101	119	66-128

(a) Outside control limits due to high level in sample relative to spike amount.

(b) Result is from Run #2.

\* = Outside of Control Limits.

## Duplicate Summary

Page 1 of 1

**Job Number:** TC20874

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20890-1DUP	SS005028.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005027.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005030.D	250	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20874-1

CAS No.	Compound	TC20890-1 ug/l	DUP Q ug/l	Q	RPD	Limits
74-82-8	Methane	20100 <sup>a</sup>	16400	E	21	53
74-85-1	Ethene	1.0 U	ND		nc	27
74-84-0	Ethane	3500 <sup>a</sup>	4020	E	14	43
74-98-6	Propane	66.8	99.1		39*	21
75-28-5	Isobutane	8.41	12.1		36*	35
106-97-8	Butane	10.3	15.1		38*	33

(a) Result is from Run #2.

\* = Outside of Control Limits.

Lab #: 321082 Job #: 20030  
 Sample Name/Number: WW11-And-120112  
 Company: Oil Tracers, LLC  
 Date Sampled: 12/01/2012  
 Container: Dissolved Gas Bottle  
 Field/Site Name: Third Quarter Well Sampling  
 Location: Parker County, Texas  
 Formation/Depth:  
 Sampling Point:  
 Date Received: 12/05/2012 Date Reported: 2/01/2013

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{18}\text{O}$ ‰
Carbon Monoxide -----	nd			
Hydrogen Sulfide -----	na			
Helium -----	na			
Hydrogen -----	nd			
Argon -----	1.70			
Oxygen -----	11.29			
Nitrogen -----	86.51			
Carbon Dioxide -----	0.34			
Methane -----	0.158			
Ethane -----	0.0029			
Ethylene -----	nd			
Propane -----	nd			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	nd			
Iso-pentane -----	nd			
N-pentane -----	nd			
Hexanes + -----	nd			

**Remarks:**

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.79

\*Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.



12/12/12

## Technical Report for

EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW10-Hay

Accutest Job Number: TC20882

Sampling Date: 12/02/12


Report to:

EarthCon Consultants  
4800 Sugar Grove Suite 420  
Stafford, TX 77477  
gfloreslovo@earthcon.com; djackson@jacksonsjoberg.com;  
mcpatton@rangeresources.com; escott@earthcon.com  
ATTN: Gabriela Floreslovo

Total number of pages in report: **26**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

  
Richard Rodriguez  
Laboratory Director

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366)  
LA (85695/04004) OK (211-035)

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Test results relate only to samples analyzed.

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Sample Summary

EarthCon Consultants

Job No: TC20882

Quarterly Well Sampling, Parker County, Texas  
Project No: 3rd Quarter / WW10-Hay

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
TC20882-1	12/02/12	08:15	12/04/12	AQ	Ground Water	WW10-HAY-120212





## SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** EarthCon Consultants

**Job No** TC20882

**Site:** Quarterly Well Sampling, Parker County, Texas

**Report Date** 12/12/2012 9:41:33 AM

1 Sample was collected on 12/02/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20882. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### Volatiles by GCMS By Method SW846 8260B

**Matrix** AQ

**Batch ID:** VK578

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20506-1MS, TC20506-1MSD were used as the QC samples indicated.

### Volatiles by GC By Method RSKSOP-147/175

**Matrix** AQ

**Batch ID:** GSS233

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20879-1DUP, TC20970-2MS were used as the QC samples indicated.
- Matrix Spike Recovery for Methane is outside control limits. Outside control limits due to high level in sample relative to spike amount.
- TC20970-2MS: Sample was not preserved to a pH < 2.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used

Summary of Hits

**Job Number:** TC20882  
**Account:** EarthCon Consultants  
**Project:** Quarterly Well Sampling, Parker County, Texas  
**Collected:** 12/02/12



Lab Sample ID	Client Sample ID	Result/ Analyte	Qual	MQL	SDL	Units	Method
TC20882-1	WW10-HAY-120212						
		Methane	0.334	0.0050	0.0030	mg/l	RSKSOP-147/175
		Ethane	0.0590	0.0010	0.00050	mg/l	RSKSOP-147/175
		Propane	0.0113	0.0015	0.00075	mg/l	RSKSOP-147/175
		Butane	0.0025	0.0015	0.00075	mg/l	RSKSOP-147/175

Sample Results

Report of Analysis

## Report of Analysis

<b>Client Sample ID:</b>	WW10-HAY-120212	<b>Date Sampled:</b>	12/02/12
<b>Lab Sample ID:</b>	TC20882-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K13196.D	1	12/06/12	EM	n/a	n/a	VK578
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

## Purgeable Aromatics

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2	Benzene	0.00034 U	0.0010	0.00034	mg/l	
108-88-3	Toluene	0.00033 U	0.0010	0.00033	mg/l	
100-41-4	Ethylbenzene	0.00032 U	0.0010	0.00032	mg/l	
1330-20-7	Xylene (total)	0.00087 U	0.0030	0.00087	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	109%		72-122%
17060-07-0	1,2-Dichloroethane-D4	107%		68-124%
2037-26-5	Toluene-D8	105%		80-119%
460-00-4	4-Bromofluorobenzene	105%		72-126%

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	WW10-HAY-120212	<b>Date Sampled:</b>	12/02/12
<b>Lab Sample ID:</b>	TC20882-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	RSKSOP-147/175		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	SS005073.D	1	12/07/12	LT	n/a	n/a	GSS233
Run #2	SS005075.D	10	12/07/12	LT	n/a	n/a	GSS233

## RSK147 Special List

CAS No.	Compound	Result	MQL	SDL	Units	Q
74-82-8	Methane	0.334 <sup>a</sup>	0.0050	0.0030	mg/l	
74-85-1	Ethene	0.00050 U	0.0010	0.00050	mg/l	
74-84-0	Ethane	0.0590	0.0010	0.00050	mg/l	
74-98-6	Propane	0.0113	0.0015	0.00075	mg/l	
75-28-5	Isobutane	0.00075 U	0.0015	0.00075	mg/l	
106-97-8	Butane	0.0025	0.0015	0.00075	mg/l	

(a) Result is from Run# 2

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Misc. Forms

5

### Custody Documents and Other Forms

---

Includes the following where applicable:

- Chain of Custody
- LRC Form



**Accutest Job Number:** TC20882      **Client:** EARTHCON CONSULTANTS      **Project:** 3RD QTR WELL SAMPLING,PARKER COUNTY,T  
**Date / Time Received:** 12/4/2012      **Delivery Method:** Client      **Airbill #'s:** \_\_\_\_\_  
**No. Coolers:** 1      **Therm ID:** IR6      **Temp Adjustment Factor:** 0.2  
**Cooler Temps (Initial/Adjusted):** #1: (2.2/2.4)

<b>Cooler Security</b>		<b>Y or N</b>		<b>Y or N</b>	
1. Custody Seals Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Cooler Temperature</b>		<b>Y or N</b>			
1. Temp criteria achieved:	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
2. Cooler temp verification:	Infrared Gun				
3. Cooler media:	Ice (bag)				
<b>Quality Control Preservation</b>	<b>Y</b>	<b>or</b>	<b>N</b>	<b>N/A</b>	<b>WTB STB</b>
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. Trip Blank listed on COC:	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Samples preserved properly:	<input checked="" type="checkbox"/>		<input type="checkbox"/>		
4. VOCs headspace free:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	

<b>Sample Integrity - Documentation</b>	<b>Y</b>	<b>or</b>	<b>N</b>
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
<b>Sample Integrity - Condition</b>	<b>Y</b>	<b>or</b>	<b>N</b>
1. Sample recvd within HT:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Condition of sample:	Intact		
<b>Sample Integrity - Instructions</b>	<b>Y</b>	<b>or</b>	<b>N</b>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Bottles received for unspecified tests	<input type="checkbox"/>		<input checked="" type="checkbox"/>
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
4. Compositing instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>		<input checked="" type="checkbox"/>

Comments -Received trip blank not listed on COC.



**Accutest Job Number:** TC20882

**CSR:** Elessa Sommers

**Response Date:** 12/5/2012

**Response:** Trip blank is on separate report.

5.1

5

**TC20882: Chain of Custody**  
**Page 3 of 4**

## Sample Receipt Log

Page 3 of 3

**Job #:** TC20882

**Date / Time Received:** 12/4/2012 9:22:00 AM

**Initials:** CH

**Client:** EARTHCON CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	pH	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20882-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20882-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20882-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20882-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20882-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20882-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4

 5.1  
5

**TC20882: Chain of Custody**
**Page 4 of 4**

# Appendix A Laboratory Data Package Cover Page

TC20882 This data package consists of

- ☐ This signature page, the laboratory review checklist, and the following reportable data:
- ☐ R1 Field chain-of-custody documentation;
- ☐ R2 Sample identification cross-reference;
- ☐ R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - a) Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
  - b) dilution factors,
  - c) preparation methods,
  - d) cleanup methods, and
  - e) if required for the project, tentatively identified compounds (TICs).
- ☐ R4 Surrogate recovery data including:
  - a) Calculated recovery (%R), and
  - b) The laboratory's surrogate QC limits.
- ☐ R5 Test reports/summary forms for blank samples;
- ☐ R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - a) LCS spiking amounts,
  - b) Calculated %R for each analyte, and
  - c) The laboratory's LCS QC limits.
- ☐ R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - a) Samples associated with the MS/MSD clearly identified,
  - b) MS/MSD spiking amounts,
  - c) Concentration of each MS/MSD analyte measured in the parent and
  - d) Calculated %Rs and relative percent differences (RPDs), and
  - e) The laboratory's MS/MSD QC limits
- ☐ R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - a) The amount of analyte measured in the duplicate,
  - b) The calculated RPD, and
  - c) The laboratory's QC limits for analytical duplicates.
- ☐ R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each
- ☐ R10 Other problems or anomalies.


The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

**Release Statement:** I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Report. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld.

**Check, if applicable:** This laboratory meets an exception under 30 TAC&25.6 and was last inspection by

[ ] [X] TCEQ or [ ] \_\_\_\_\_ on April 2011. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

## QA Manager

Name (Printed)	Signature	Official Title (printed)	Date
Richard Rodriguez		Laboratory Director	12/12/2012
_____	_____	_____	_____

LABORATORY REVIEW CHECKLIST: REPORTABLE DATA									
Laboratory Name:		Accutest Gulf Coast		LRC Date:		12/12/2012			
Project Name:		Quarterly Well Sampling, Parker County, Texas		Laboratory Project Number:		TC20882			
Reviewer Name:		Anita Patel		Prep Batch Number(s):		GSS233, VK578			
# <sup>1</sup>	A <sup>2</sup>	DESCRIPTION				YES	NO	NA <sup>3</sup>	NR <sup>4</sup>   ER # <sup>5</sup>
R1	OI	<b>CHAIN-OF-CUSTODY (C-O-C):</b>							
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?				X			
		Were all departures from standard conditions described in an exception report?				X			
R2	OI	<b>Sample and quality control (QC) identification</b>							
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?				X			
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?				X			
R3	OI	<b>Test reports</b>							
		Were samples prepared and analyzed within holding times?				X			
		Other than those results <MQL, were all other raw values bracketed by calibration standards?				X			
		Were calculations checked by a peer or supervisor?				X			
		Were all analyte identifications checked by a peer or supervisor?				X			
		Were sample detection limits reported for all analytes not detected?				X			
		Were all results for soil and sediment samples reported on a dry weight basis?						X	
		Were % moisture (or solids) reported for all soil and sediment samples?						X	
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?						X	
		If required for the project, are TIC's reported?						X	
R4	O	<b>Surrogate recovery data</b>							
		Were surrogates added prior to extraction?				X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?				X			
R5	OI	<b>Test reports/summary forms for blank samples</b>							
		Were appropriate type(s) of blanks analyzed?				X			
		Were blanks analyzed at the appropriate frequency?				X			
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?				X			
		Were blank concentrations <MQL?				X			
R6	OI	<b>Laboratory control samples (LCS):</b>							
		Were all COCs included in the LCS?				X			
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?				X			
		Were LCSs analyzed at required frequency?				X			
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?				X			
		Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?				X			5
		Was the LCSD RPD within QC limits?						X	
R7	OI	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>							
		Were the project/method specified analytes included in the MS and MSD?				X			
		Were MS/MSD analyzed at the appropriate frequency?				X			
		Were MS (and MSD, if applicable) %Rs within the laboratory QC Limits?					X		4
		Were the MS/MSD RPDs within laboratory QC limits?				X			
R8	OI	<b>Analytical duplicate data</b>							
		Were appropriate analytical duplicates analyzed for each matrix?				X			
		Were analytical duplicates analyzed at the appropriate frequency?				X			
		Were RPDs or relative standard deviations within the laboratory QC limits?				X			
R9	OI	<b>Method quantitation limits (MQLs):</b>							
		Are the MQLs for each method analyte included in the laboratory data package?				X			
		Do the MQLs correspond to the concentration of the lowest non-zero calibration				X			
		Are unadjusted MQLs and DCSSs included in the laboratory data package?					X		2
R10	OI	<b>Other problems/anomalies</b>							
		Are all known problems/anomalies/special conditions noted in this LRC and ER?				X			
		Was applicable and available technology used to lower the SDL to minimize the				X			
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package?				X			3

Laboratory Name:		Accutest Gulf Coast	LRC Date:		12/12/2012	
Project Name:		Quarterly Well Sampling, Parker	Laboratory Project Number:		TC20882	
Reviewer Name:		Anita Patel	Prep Batch Number(s):		GSS233, VK578	
# <sup>1</sup>	A <sup>2</sup>	DESCRIPTION	YES	NO	NA <sup>3</sup>	NR <sup>4</sup> ER # <sup>5</sup>
S1	OI	<b>Initial calibration (ICAL)</b>				
		Were response factors and/or relative response factors for each analyte within QC limits?	X			
		Were percent RSDs or correlation coefficient criteria met?	X			
		Was the number of standards recommended in the method used for all analytes?	X			
		Were all points generated between the lowest and highest standard used to calculate the curve?	X			
		Are ICAL data available for all instruments used?	X			
		Has the initial calibration curve been verified using an appropriate second source standard?	X			
S2	OI	<b>Initial and continuing calibration verification (ICCV AND CCV) and continuing</b>				
		Was the CCV analyzed at the method-required frequency?	X			
		Were percent differences for each analyte within the method-required QC limits?	X			
		Was the ICAL curve verified for each analyte?	X			
		Was the absolute value of the analyte concentration in the inorganic CCB<MDL?			X	
S3	O	<b>Mass spectral tuning</b>				
		Was the appropriate compound for the method used for tuning?	X			
		Were ion abundance data within the method-required QC limits?	X			
S4	O	<b>Internal standards (IS)</b>				
		Were IS area counts and retention times within the method-required QC limits?	X			
S5	OI	<b>Raw data (NELAC Section 5.5.10)</b>				
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X			
		Were data associated with manual integrations flagged on the raw data?	X			
S6	O	<b>Dual column confirmation</b>				
		Did dual column confirmation results meet the method-required QC?			X	
S7	O	<b>Tentatively identified compounds (TICs):</b>				
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X	
S8	I	<b>Interference Check Sample (ICS) results</b>				
		Were percent recoveries within method QC limits?			X	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>				
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X	
S10	OI	<b>Method detection limit (MDL) studies</b>				
		Was a MDL study performed for each reported analyte?	X			
		Is the MDL either adjusted or supported by the analysis of DCSSs?	X			5
S11	OI	<b>Proficiency test reports</b>				
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X			
S12	OI	<b>Standards documentation</b>				
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate source?	X			
S13	OI	<b>Compound/analyte identification procedures</b>				
		Are the procedures for compound/analyte identification documented?	X			
S14	OI	<b>Demonstration of analyst competency (DOC)</b>				
		Was DOC conducted consistent with NELAC Chapter 5?	X			
		Is documentation of the analyst's competency up-to-date and on file?	X			
S15	OI	<b>Verification/validation documentation for methods (NELAC Chapter 5)</b>				
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X			
S16	OI	<b>Laboratory standard operating procedures (SOPs)</b>				
		Are laboratory SOPs current and on file for each method performed?	X			

LABORATORY REVIEW CHECKLIST (continued): Exception Reports			
Laboratory Name:	Accutest Gulf Coast	LRC Date:	12/12/2012
Project Name:	Quarterly Well Sampling, Parker	Laboratory Project Number:	TC20882
Reviewer Name:	Anita Patel	Prep Batch Number(s):	GSS233, VK578
ER#	Description		
1	For reporting purposes, the MQL is defined in the report as the RL. The unadjusted MQL/RL is reported in the method blank. The SDL is defined in the report as the MDL.		
2	For reporting purposes, the method blank represents the unadjusted MQL. The DCS is on file in the laboratory and is not included in the laboratory data package.		
3	The laboratory is NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package for analytes that are listed in the Texas Fields of Accreditation.		
4	All anomalies are discussed in the case narrative.		
5	The laboratory does not perform DCS analysis for Method RSKSOP-147/175. The components reported are not listed or do not have values in the Texas TRRP PCL tables.		

1ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on

## GC/MS Volatiles

### QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** TC20882

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VK578-MB	K13177.D	1	12/06/12	EM	n/a	n/a	VK578

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20882-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.34	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l	
108-88-3	Toluene	ND	1.0	0.33	ug/l	
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	107% 72-122%
17060-07-0	1,2-Dichloroethane-D4	105% 68-124%
2037-26-5	Toluene-D8	107% 80-119%
460-00-4	4-Bromofluorobenzene	103% 72-126%



## Blank Spike Summary

Page 1 of 1

**Job Number:** TC20882

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VK578-BS	K13175.D	1	12/06/12	EM	n/a	n/a	VK578

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20882-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	23.5	94	68-119
100-41-4	Ethylbenzene	25	23.4	94	71-117
108-88-3	Toluene	25	23.0	92	73-119
1330-20-7	Xylene (total)	75	71.7	96	74-119

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	103%	68-124%
2037-26-5	Toluene-D8	105%	80-119%
460-00-4	4-Bromofluorobenzene	101%	72-126%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** TC20882

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20506-1MS	K13179.D	1	12/06/12	EM	n/a	n/a	VK578
TC20506-1MSD	K13180.D	1	12/06/12	EM	n/a	n/a	VK578
TC20506-1	K13178.D	1	12/06/12	EM	n/a	n/a	VK578

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20882-1

CAS No.	Compound	TC20506-1 ug/l	Spike Q	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	25	23.4	94	23.1	92	1	68-119/12
100-41-4	Ethylbenzene	ND	25	22.9	92	22.6	90	1	71-117/12
108-88-3	Toluene	ND	25	23.0	92	22.1	88	4	73-119/13
1330-20-7	Xylene (total)	ND	75	71.6	95	69.3	92	3	74-119/13

CAS No.	Surrogate Recoveries	MS	MSD	TC20506-1	Limits
1868-53-7	Dibromofluoromethane	108%	108%	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	103%	105%	104%	68-124%
2037-26-5	Toluene-D8	107%	105%	106%	80-119%
460-00-4	4-Bromofluorobenzene	103%	104%	104%	72-126%

\* = Outside of Control Limits.

## GC Volatiles

## QC Data Summaries

---

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** TC20882

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS233-MB	SS005056.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20882-1

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	ND	0.50	0.30	ug/l	
74-85-1	Ethene	ND	1.0	0.50	ug/l	
74-84-0	Ethane	ND	1.0	0.50	ug/l	
74-98-6	Propane	ND	1.5	0.75	ug/l	
75-28-5	Isobutane	ND	1.5	0.75	ug/l	
106-97-8	Butane	ND	1.5	0.75	ug/l	

## Blank Spike Summary

Page 1 of 1

**Job Number:** TC20882

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS233-BS	SS005054.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20882-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	21.5	16.2	75	68-139
74-85-1	Ethene	57.4	43.2	75	52-145
74-84-0	Ethane	43.3	47.1	109	68-131
74-98-6	Propane	60.6	60.5	100	69-131
75-28-5	Isobutane	72.5	70.4	97	72-131
106-97-8	Butane	76.6	73.6	96	66-128

\* = Outside of Control Limits.

## Matrix Spike Summary

Page 1 of 1

**Job Number:** TC20882

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20970-2MS <sup>a</sup>	SS005067.D	1	12/07/12	LT	n/a	n/a	GSS233
TC20970-2 <sup>a</sup>	SS005066.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20882-1

CAS No.	Compound	TC20970-2 ug/l	Spike Q ug/l	MS ug/l	MS %	Limits
74-82-8	Methane	105	21.5	95.8	-42* <sup>b</sup>	68-139
74-85-1	Ethene	ND	57.4	46.6	81	52-145
74-84-0	Ethane	4.71	43.3	46.7	97	68-131
74-98-6	Propane	ND	60.6	53.4	88	69-131
75-28-5	Isobutane	ND	72.5	61.8	85	72-131
106-97-8	Butane	ND	76.6	66.0	86	66-128

(a) Sample was not preserved to a pH < 2.

(b) Outside control limits due to high level in sample relative to spike amount.

\* = Outside of Control Limits.

## Duplicate Summary

Page 1 of 1

**Job Number:** TC20882

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20879-1DUP	SS005062.D	1	12/07/12	LT	n/a	n/a	GSS233
TC20879-1	SS005061.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20882-1

CAS No.	Compound	TC20879-1	DUP	Q	RPD	Limits
		ug/l	Q ug/l			
74-82-8	Methane	4.10	3.34		20	53
74-85-1	Ethene	1.0 U	ND		nc	27
74-84-0	Ethane	1.0 U	ND		nc	43
74-98-6	Propane	1.5 U	ND		nc	21
75-28-5	Isobutane	1.5 U	ND		nc	35
106-97-8	Butane	1.5 U	ND		nc	33

\* = Outside of Control Limits.



12/12/12

## Technical Report for

EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW20-Huf

Accutest Job Number: TC20875

Sampling Date: 12/01/12


Report to:

EarthCon Consultants  
4800 Sugar Grove Suite 420  
Stafford, TX 77477  
gfloreslovo@earthcon.com; djackson@jacksonsjoberg.com;  
mcpatton@rangeresources.com; escott@earthcon.com  
ATTN: Gabriela Floreslovo

Total number of pages in report: **26**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

  
Richard Rodriguez  
Laboratory Director

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366)  
LA (85695/04004) OK (211-035)

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Test results relate only to samples analyzed.



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Sample Summary

EarthCon Consultants

Job No: TC20875

Quarterly Well Sampling, Parker County, Texas  
Project No: 3rd Quarter / WW20-Huf

Sample Number	Collected		Matrix		Client Sample ID
	Date	Time By	Received	Code Type	
TC20875-1	12/01/12	09:28	12/04/12	AQ Ground Water	WW20-HUF-120112

## SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** EarthCon Consultants

**Job No** TC20875

**Site:** Quarterly Well Sampling, Parker County, Texas

**Report Date** 12/12/2012 12:12:44 P

1 Sample was collected on 12/01/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20875. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### Volatiles by GCMS By Method SW846 8260B

**Matrix** AQ

**Batch ID:** VX1673

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20864-1MS, TC20864-1MSD were used as the QC samples indicated.

### Volatiles by GC By Method RSKSOP-147/175

**Matrix** AQ

**Batch ID:** GSS232

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20890-1DUP, TC20890-1MS were used as the QC samples indicated.
- Matrix Spike Recovery(s) for Ethene, Propane are outside control limits. Probable cause due to matrix interference.
- Matrix Spike Recovery(s) for Ethane, Methane are outside control limits. Outside control limits due to high level in sample relative to spike amount.
- RPD(s) for Duplicate for Butane, Isobutane, Propane are outside control limits for sample TC20890-1DUP.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used

Summary of Hits

**Job Number:** TC20875  
**Account:** EarthCon Consultants  
**Project:** Quarterly Well Sampling, Parker County, Texas  
**Collected:** 12/01/12



Lab Sample ID	Client Sample ID	Result/ Qual	MQL	SDL	Units	Method
TC20875-1	WW20-HUF-120112					
Methane		0.669	0.0050	0.0030	mg/l	RSKSOP-147/175
Ethane		0.0213	0.0010	0.00050	mg/l	RSKSOP-147/175

Sample Results

Report of Analysis

## Report of Analysis

<b>Client Sample ID:</b>	WW20-HUF-120112	<b>Date Sampled:</b>	12/01/12
<b>Lab Sample ID:</b>	TC20875-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	X0087072.D	1	12/06/12	CF	n/a	n/a	VX1673
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

## Purgeable Aromatics

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2	Benzene	0.00034 U	0.0010	0.00034	mg/l	
108-88-3	Toluene	0.00033 U	0.0010	0.00033	mg/l	
100-41-4	Ethylbenzene	0.00032 U	0.0010	0.00032	mg/l	
1330-20-7	Xylene (total)	0.00087 U	0.0030	0.00087	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%		72-122%
17060-07-0	1,2-Dichloroethane-D4	96%		68-124%
2037-26-5	Toluene-D8	100%		80-119%
460-00-4	4-Bromofluorobenzene	99%		72-126%

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	WW20-HUF-120112	<b>Date Sampled:</b>	12/01/12
<b>Lab Sample ID:</b>	TC20875-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	RSKSOP-147/175		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	SS005045.D	1	12/06/12	LT	n/a	n/a	GSS232
Run #2	SS005048.D	10	12/06/12	LT	n/a	n/a	GSS232

## RSK147 Special List

CAS No.	Compound	Result	MQL	SDL	Units	Q
74-82-8	Methane	0.669 <sup>a</sup>	0.0050	0.0030	mg/l	
74-85-1	Ethene	0.00050 U	0.0010	0.00050	mg/l	
74-84-0	Ethane	0.0213	0.0010	0.00050	mg/l	
74-98-6	Propane	0.00075 U	0.0015	0.00075	mg/l	
75-28-5	Isobutane	0.00075 U	0.0015	0.00075	mg/l	
106-97-8	Butane	0.00075 U	0.0015	0.00075	mg/l	

(a) Result is from Run# 2

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Misc. Forms

5

### Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody
- LRC Form



10165 Harwin Dr, Ste 150 Houston, TX 77036  
TEL: 713-271-4700 FAX: 713-271-4770  
[www.accutest.com](http://www.accutest.com)

<p><b>ACCUTEST</b> Laboratories</p>		10165 Harwin Dr, Ste 150 Houston, TX 77036 TEL: 713-271-4700 FAX: 713-271-4770 www.acctest.com		FED-EX Tracking # _____ Accutest Quote # _____		Bottle Order Control # _____ Accutest Job # <b>TC 20875</b>																
Client / Reporting Information		Project Information				Requested Analyses										Matrix Codes						
Company Name <b>EarthCon Consultants, Inc.</b>		Project Name: <b>Third Quarterly Well Sampling, Parker County, Texas</b>				<b>BTEX 8260B</b> Butane, Ethane, Ethene, Isobutane, Methane, Propane by RSK-175											DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OL - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB-Field Blank					
Street Address <b>4800 Sugar Grove Blvd., Suite 390</b>		Street		<b>Billing Information (if different from Report to)</b>																		
City State Zip <b>Stafford TX 77477</b>		City State		Company Name																		
Project Contact E-mail <b>Gabriela Floreslovo</b>		Project #		Street Address																		
Phone # Fax # <b>281-201-3513</b>		Client Purchase Order #		City State Zip																		
Sampler(s) Name(s) <b>JB, SH, RM</b>		Phone #		Project Manager		Attention:																
Field ID / Point of Collection		Date		Time		Sampled By		Matrix		# of bottles		Collection Number of preserved Bottles										LAB USE ONLY
												<input type="checkbox"/> HCl <input type="checkbox"/> MeSH <input type="checkbox"/> ZnAcOH <input type="checkbox"/> HN03 <input type="checkbox"/> H2SO4 <input type="checkbox"/> NONE <input type="checkbox"/> DIWater <input type="checkbox"/> MeOH <input type="checkbox"/> TSP <input type="checkbox"/> NaHCO4 <input type="checkbox"/> ENCORE <input type="checkbox"/> OTHER										
1 WWSO-H.S. 120112		12/1/12		0928		JTB		G2		6		X X										
<b>JB</b>																						
Turnaround Time ( Business days )		Data Deliverable Information		Comments / Special Instructions																		
<input checked="" type="checkbox"/> Standard <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 4 Day RUSH <input type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day EMERGENCY <small>Emergency &amp; Rush T/A data available via Lablink</small>		Approved By (Accutest PM): / Date: _____ _____ _____		<input type="checkbox"/> Commercial "A" ( Level 1 ) <input type="checkbox"/> Commercial "B" ( Level 2 ) <input type="checkbox"/> FULLT1 ( Level 3+4 ) <input type="checkbox"/> REDT1 ( Level 3+4 ) <input type="checkbox"/> Commercial "C" <small>Commercial "A" = Results Only          Commercial "B" = Results + QC Summary          Commercial "C" = Results + QC &amp; Surrogate Summary</small>		<input checked="" type="checkbox"/> TRRP <input type="checkbox"/> EDD Format <input type="checkbox"/> Other _____																
Relinquished by Sampler: <i>[Signature]</i>		Date Time: 12-4-12 0922		Received By: <i>[Signature]</i>		Relinquished By: 2		Date Time:		Received By: 2												
Relinquished by Sampler:		Date Time:		Received By: 3		Relinquished By: 4		Date Time:		Received By: 4												
Relinquished by: 3		Date Time:		Received By: 5		Customary Seal #		Preserved where applicable		On Ice Cooler Temp.												

## TC20875: Chain of Custody

Page 1 of 4

**Accutest Job Number:** TC20875      **Client:** EARTHCON CONSULTANTS      **Project:** 3RD QTR WELL SAMPLING,PARKER COUNTY,T  
**Date / Time Received:** 12/4/2012      **Delivery Method:** Client      **Airbill #'s:** \_\_\_\_\_  
**No. Coolers:** 1      **Therm ID:** IR6      **Temp Adjustment Factor:** 0.2  
**Cooler Temps (Initial/Adjusted):** #1: (2.2/2.4)

<b>Cooler Security</b>		<b>Y or N</b>		<b>Y or N</b>	
1. Custody Seals Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Cooler Temperature</b>		<b>Y or N</b>			
1. Temp criteria achieved:	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
2. Cooler temp verification:	Infrared Gun				
3. Cooler media:	Ice (bag)				
<b>Quality Control Preservation</b>		<b>Y or N</b>	<b>N/A</b>	<b>WTB</b>	<b>STB</b>
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Trip Blank listed on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
3. Samples preserved properly:	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
4. VOCs headspace free:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

<b>Sample Integrity - Documentation</b>		<b>Y or N</b>	
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Container labeling complete:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>Sample Integrity - Condition</b>		<b>Y or N</b>	
1. Sample recvd within HT:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. All containers accounted for:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Condition of sample:	Intact		
<b>Sample Integrity - Instructions</b>		<b>Y or N</b>	<b>N/A</b>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments -Received trip blank not listed on COC.

**Accutest Job Number:** TC20875

**CSR:** Elessa Sommers

**Response Date:** 12/5/2012

**Response:** Trip blank is on separate report.

5.1

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**TC20875: Chain of Custody**

**Page 3 of 4**

## Sample Receipt Log

Page 3 of 3

**Job #:** TC20875

**Date / Time Received:** 12/4/2012 9:22:00 AM

**Initials:** CH

**Client:** EARTHCON CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	pH	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20875-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20875-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20875-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20875-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20875-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20875-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4

5.1

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**TC20875: Chain of Custody**
**Page 4 of 4**

# Appendix A Laboratory Data Package Cover Page

TC20875 This data package consists of

- ☐ This signature page, the laboratory review checklist, and the following reportable data:
- ☐ R1 Field chain-of-custody documentation;
- ☐ R2 Sample identification cross-reference;
- ☐ R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - a) Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
  - b) dilution factors,
  - c) preparation methods,
  - d) cleanup methods, and
  - e) if required for the project, tentatively identified compounds (TICs).
- ☐ R4 Surrogate recovery data including:
  - a) Calculated recovery (%R), and
  - b) The laboratory's surrogate QC limits.
- ☐ R5 Test reports/summary forms for blank samples;
- ☐ R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - a) LCS spiking amounts,
  - b) Calculated %R for each analyte, and
  - c) The laboratory's LCS QC limits.
- ☐ R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - a) Samples associated with the MS/MSD clearly identified,
  - b) MS/MSD spiking amounts,
  - c) Concentration of each MS/MSD analyte measured in the parent and
  - d) Calculated %Rs and relative percent differences (RPDs), and
  - e) The laboratory's MS/MSD QC limits
- ☐ R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - a) The amount of analyte measured in the duplicate,
  - b) The calculated RPD, and
  - c) The laboratory's QC limits for analytical duplicates.
- ☐ R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each
- ☐ R10 Other problems or anomalies.


The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

**Release Statement:** I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Report. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld.

**Check, if applicable:** This laboratory meets an exception under 30 TAC&25.6 and was last inspection by

☐ [X] TCEQ or ☐ \_\_\_\_\_ on April 2011. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

## QA Manager

Name (Printed)	Signature	Official Title (printed)	Date
Richard Rodriguez		Laboratory Director	12/12/2012
_____			_____

LABORATORY REVIEW CHECKLIST: REPORTABLE DATA									
Laboratory Name:		Accutest Gulf Coast		LRC Date:		12/12/2012			
Project Name:		Quarterly Well Sampling, Parker County, Texas		Laboratory Project Number:		TC20875			
Reviewer Name:		Anita Patel		Prep Batch Number(s):		GSS232, VX1673			
# <sup>1</sup>	A <sup>2</sup>	DESCRIPTION				YES	NO	NA <sup>3</sup>	NR <sup>4</sup> ER # <sup>5</sup>
R1	OI	<b>CHAIN-OF-CUSTODY (C-O-C):</b>							
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?				X			
		Were all departures from standard conditions described in an exception report?				X			
R2	OI	<b>Sample and quality control (QC) identification</b>							
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?				X			
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?				X			
R3	OI	<b>Test reports</b>							
		Were samples prepared and analyzed within holding times?				X			
		Other than those results <MQL, were all other raw values bracketed by calibration standards?				X			
		Were calculations checked by a peer or supervisor?				X			
		Were all analyte identifications checked by a peer or supervisor?				X			
		Were sample detection limits reported for all analytes not detected?				X			
		Were all results for soil and sediment samples reported on a dry weight basis?						X	
		Were % moisture (or solids) reported for all soil and sediment samples?						X	
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?						X	
		If required for the project, are TIC's reported?						X	
R4	O	<b>Surrogate recovery data</b>							
		Were surrogates added prior to extraction?				X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?				X			
R5	OI	<b>Test reports/summary forms for blank samples</b>							
		Were appropriate type(s) of blanks analyzed?				X			
		Were blanks analyzed at the appropriate frequency?				X			
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?				X			
		Were blank concentrations <MQL?				X			
R6	OI	<b>Laboratory control samples (LCS):</b>							
		Were all COCs included in the LCS?				X			
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?				X			
		Were LCSs analyzed at required frequency?				X			
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?				X			
		Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?				X			5
		Was the LCSD RPD within QC limits?						X	
R7	OI	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>							
		Were the project/method specified analytes included in the MS and MSD?				X			
		Were MS/MSD analyzed at the appropriate frequency?				X			
		Were MS (and MSD, if applicable) %Rs within the laboratory QC Limits?					X		4
		Were the MS/MSD RPDs within laboratory QC limits?				X			
R8	OI	<b>Analytical duplicate data</b>							
		Were appropriate analytical duplicates analyzed for each matrix?				X			
		Were analytical duplicates analyzed at the appropriate frequency?				X			
		Were RPDs or relative standard deviations within the laboratory QC limits?					X		4
R9	OI	<b>Method quantitation limits (MQLs):</b>							
		Are the MQLs for each method analyte included in the laboratory data package?				X			
		Do the MQLs correspond to the concentration of the lowest non-zero calibration				X			
		Are unadjusted MQLs and DCs included in the laboratory data package?					X		2
R10	OI	<b>Other problems/anomalies</b>							
		Are all known problems/anomalies/special conditions noted in this LRC and ER?				X			
		Was applicable and available technology used to lower the SDL to minimize the				X			
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package?				X			3

Laboratory Name:		Accutest Gulf Coast	LRC Date:		12/12/2012	
Project Name:		Quarterly Well Sampling, Parker	Laboratory Project Number:		TC20875	
Reviewer Name:		Anita Patel	Prep Batch Number(s):		GSS232, VX1673	
# <sup>1</sup>	A <sup>2</sup>	DESCRIPTION	YES	NO	NA <sup>3</sup>	NR <sup>4</sup> ER # <sup>5</sup>
S1	OI	<b>Initial calibration (ICAL)</b>				
		Were response factors and/or relative response factors for each analyte within QC limits?	X			
		Were percent RSDs or correlation coefficient criteria met?	X			
		Was the number of standards recommended in the method used for all analytes?	X			
		Were all points generated between the lowest and highest standard used to calculate the curve?	X			
		Are ICAL data available for all instruments used?	X			
		Has the initial calibration curve been verified using an appropriate second source standard?	X			
S2	OI	<b>Initial and continuing calibration verification (ICCV AND CCV) and continuing</b>				
		Was the CCV analyzed at the method-required frequency?	X			
		Were percent differences for each analyte within the method-required QC limits?	X			
		Was the ICAL curve verified for each analyte?	X			
		Was the absolute value of the analyte concentration in the inorganic CCB<MDL?			X	
S3	O	<b>Mass spectral tuning</b>				
		Was the appropriate compound for the method used for tuning?	X			
		Were ion abundance data within the method-required QC limits?	X			
S4	O	<b>Internal standards (IS)</b>				
		Were IS area counts and retention times within the method-required QC limits?	X			
S5	OI	<b>Raw data (NELAC Section 5.5.10)</b>				
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X			
		Were data associated with manual integrations flagged on the raw data?	X			
S6	O	<b>Dual column confirmation</b>				
		Did dual column confirmation results meet the method-required QC?			X	
S7	O	<b>Tentatively identified compounds (TICs):</b>				
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X	
S8	I	<b>Interference Check Sample (ICS) results</b>				
		Were percent recoveries within method QC limits?			X	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>				
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X	
S10	OI	<b>Method detection limit (MDL) studies</b>				
		Was a MDL study performed for each reported analyte?	X			
		Is the MDL either adjusted or supported by the analysis of DCSs?	X			5
S11	OI	<b>Proficiency test reports</b>				
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X			
S12	OI	<b>Standards documentation</b>				
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate source?	X			
S13	OI	<b>Compound/analyte identification procedures</b>				
		Are the procedures for compound/analyte identification documented?	X			
S14	OI	<b>Demonstration of analyst competency (DOC)</b>				
		Was DOC conducted consistent with NELAC Chapter 5?	X			
		Is documentation of the analyst's competency up-to-date and on file?	X			
S15	OI	<b>Verification/validation documentation for methods (NELAC Chapter 5)</b>				
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X			
S16	OI	<b>Laboratory standard operating procedures (SOPs)</b>				
		Are laboratory SOPs current and on file for each method performed?	X			

LABORATORY REVIEW CHECKLIST (continued): Exception Reports			
Laboratory Name:		Accutest Gulf Coast	LRC Date:
Project Name:		Quarterly Well Sampling, Parker	12/12/2012
Reviewer Name:		Anita Patel	Laboratory Project Number:
			TC20875
		Prep Batch Number(s):	GSS232, VX1673
ER# <sup>1</sup>	Description		
1	For reporting purposes, the MQL is defined in the report as the RL. The unadjusted MQL/RL is reported in the method blank. The SDL is defined in the report as the MDL.		
2	For reporting purposes, the method blank represents the unadjusted MQL. The DCS is on file in the laboratory and is not included in the laboratory data package.		
3	The laboratory is NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package for analytes that are listed in the Texas Fields of Accreditation.		
4	All anomalies are discussed in the case narrative.		
5	The laboratory does not perform DCS analysis for Method RSKSOP-147/175. The components reported are not listed or do not have values in the Texas TRRP PCL tables.		

1ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on



## GC/MS Volatiles

## QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** TC20875

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VX1673-MB	X0087062.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20875-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.34	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l	
108-88-3	Toluene	ND	1.0	0.33	ug/l	
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	105% 72-122%
17060-07-0	1,2-Dichloroethane-D4	95% 68-124%
2037-26-5	Toluene-D8	99% 80-119%
460-00-4	4-Bromofluorobenzene	98% 72-126%

## Blank Spike Summary

Page 1 of 1

**Job Number:** TC20875

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VX1673-BS	X0087060.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20875-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	22.2	89	68-119
100-41-4	Ethylbenzene	25	22.1	88	71-117
108-88-3	Toluene	25	22.4	90	73-119
1330-20-7	Xylene (total)	75	67.7	90	74-119

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	101%	72-122%
17060-07-0	1,2-Dichloroethane-D4	99%	68-124%
2037-26-5	Toluene-D8	101%	80-119%
460-00-4	4-Bromofluorobenzene	92%	72-126%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** TC20875

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20864-1MS	X0087064.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1MSD	X0087065.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1	X0087063.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20875-1

CAS No.	Compound	TC20864-1		Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
		ug/l	Q							
71-43-2	Benzene	1.0 U		25	23.0	92	22.4	90	3	68-119/12
100-41-4	Ethylbenzene	1.0 U		25	22.7	91	22.4	90	1	71-117/12
108-88-3	Toluene	1.0 U		25	22.9	92	22.5	90	2	73-119/13
1330-20-7	Xylene (total)	3.0 U		75	69.8	93	68.4	91	2	74-119/13

CAS No.	Surrogate Recoveries	MS	MSD	TC20864-1	Limits
1868-53-7	Dibromofluoromethane	103%	101%	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	98%	98%	96%	68-124%
2037-26-5	Toluene-D8	100%	100%	100%	80-119%
460-00-4	4-Bromofluorobenzene	91%	92%	98%	72-126%

\* = Outside of Control Limits.

## GC Volatiles

## QC Data Summaries

---

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** TC20875

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS232-MB	SS005026.D	1	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20875-1

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	ND	0.50	0.30	ug/l	
74-85-1	Ethene	ND	1.0	0.50	ug/l	
74-84-0	Ethane	ND	1.0	0.50	ug/l	
74-98-6	Propane	ND	1.5	0.75	ug/l	
75-28-5	Isobutane	ND	1.5	0.75	ug/l	
106-97-8	Butane	ND	1.5	0.75	ug/l	

## Blank Spike Summary

Page 1 of 1

**Job Number:** TC20875

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS232-BS	SS005023.D	1	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20875-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	21.5	21.0	98	68-139
74-85-1	Ethene	57.4	54.7	95	52-145
74-84-0	Ethane	43.3	56.7	131	68-131
74-98-6	Propane	60.6	68.2	113	69-131
75-28-5	Isobutane	72.5	77.3	107	72-131
106-97-8	Butane	76.6	82.4	108	66-128

\* = Outside of Control Limits.

## Matrix Spike Summary

Page 1 of 1

**Job Number:** TC20875

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20890-1MS	SS005029.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005027.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005030.D	250	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

Method: RKSOP-147/175

TC20875-1

CAS No.	Compound	TC20890-1 ug/l	Spike Q	MS ug/l	MS %	Limits
74-82-8	Methane	20100 <sup>b</sup>	21.5	17100	-13815*	Ø8-139
74-85-1	Ethene	1.0 U	57.4	5540	9654*	52-145
74-84-0	Ethane	3500 <sup>b</sup>	43.3	4120	1431* <sup>a</sup>	68-131
74-98-6	Propane	66.8	60.6	172	174*	69-131
75-28-5	Isobutane	8.41	72.5	93.3	117	72-131
106-97-8	Butane	10.3	76.6	101	119	66-128

(a) Outside control limits due to high level in sample relative to spike amount.

(b) Result is from Run #2.

\* = Outside of Control Limits.



## Duplicate Summary

Page 1 of 1

**Job Number:** TC20875

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20890-1DUP	SS005028.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005027.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005030.D	250	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20875-1

CAS No.	Compound	TC20890-1 ug/l	DUP Q ug/l	Q	RPD	Limits
74-82-8	Methane	20100 <sup>a</sup>	16400	E	21	53
74-85-1	Ethene	1.0 U	ND		nc	27
74-84-0	Ethane	3500 <sup>a</sup>	4020	E	14	43
74-98-6	Propane	66.8	99.1		39*	21
75-28-5	Isobutane	8.41	12.1		36*	35
106-97-8	Butane	10.3	15.1		38*	33

(a) Result is from Run #2.

\* = Outside of Control Limits.

Lab #: 321083 Job #: 20030  
 Sample Name/Number: WW20-HUF-120112  
 Company: Oil Tracers, LLC  
 Date Sampled: 12/01/2012  
 Container: Dissolved Gas Bottle  
 Field/Site Name: Third Quarter Well Sampling  
 Location: Parker County, Texas  
 Formation/Depth:  
 Sampling Point:  
 Date Received: 12/05/2012 Date Reported: 2/01/2013

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{18}\text{O}$ ‰
Carbon Monoxide -----	nd			
Hydrogen Sulfide -----	na			
Helium -----	na			
Hydrogen -----	nd			
Argon -----	1.56			
Oxygen -----	0.11			
Nitrogen -----	87.87			
Carbon Dioxide -----	0.14			
Methane -----	10.28	-44.67	-117.8	
Ethane -----	0.0320			
Ethylene -----	nd			
Propane -----	nd			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	0.0078			
Iso-pentane -----	nd			
N-pentane -----	nd			
Hexanes + -----	nd			

**Remarks:**

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.75

\*Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.



12/12/12

## Technical Report for

EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW14A-Hur

Accutest Job Number: TC20883

Sampling Date: 12/02/12


Report to:

EarthCon Consultants  
4800 Sugar Grove Suite 420  
Stafford, TX 77477  
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mcpatton@rangeresources.com; escott@earthcon.com  
ATTN: Gabriela Floreslovo

Total number of pages in report: **30**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

  
Richard Rodriguez  
Laboratory Director

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366)  
LA (85695/04004) OK (211-035)

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Test results relate only to samples analyzed.

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Sample Summary

EarthCon Consultants

Job No: TC20883

Quarterly Well Sampling, Parker County, Texas  
Project No: 3rd Quarter / WW14A-Hur

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
TC20883-1	12/02/12	10:47	12/04/12	AQ	Ground Water	WW14A-HUR-120212



## SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** EarthCon Consultants

**Job No** TC20883

**Site:** Quarterly Well Sampling, Parker County, Texas

**Report Date** 12/12/2012 1:50:13 PM

1 Sample was collected on 12/02/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20883. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### Volatiles by GCMS By Method SW846 8260B

**Matrix** AQ

**Batch ID:** VK578

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20506-1MS, TC20506-1MSD were used as the QC samples indicated.

### Volatiles by GC By Method RSKSOP-147/175

**Matrix** AQ

**Batch ID:** GSS233

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20879-1DUP, TC20970-2MS were used as the QC samples indicated.
- TC20970-2MS: Sample was not preserved to a pH < 2.

**Matrix** AQ

**Batch ID:** GSS234

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC21021-1DUP, TC21021-2MS were used as the QC samples indicated.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used

Summary of Hits

**Job Number:** TC20883  
**Account:** EarthCon Consultants  
**Project:** Quarterly Well Sampling, Parker County, Texas  
**Collected:** 12/02/12



Lab Sample ID	Client Sample ID	Result/ Analyte	Qual	MQL	SDL	Units	Method
TC20883-1	WW14A-HUR-120212						
		Methane	0.699	0.0050	0.0030	mg/l	RSKSOP-147/175
		Ethane	0.0705	0.0010	0.00050	mg/l	RSKSOP-147/175

Sample Results

Report of Analysis



## Report of Analysis

<b>Client Sample ID:</b>	WW14A-HUR-120212	<b>Date Sampled:</b>	12/02/12
<b>Lab Sample ID:</b>	TC20883-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K13197.D	1	12/06/12	EM	n/a	n/a	VK578
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

## Purgeable Aromatics

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2	Benzene	0.00034 U	0.0010	0.00034	mg/l	
108-88-3	Toluene	0.00033 U	0.0010	0.00033	mg/l	
100-41-4	Ethylbenzene	0.00032 U	0.0010	0.00032	mg/l	
1330-20-7	Xylene (total)	0.00087 U	0.0030	0.00087	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	111%		72-122%
17060-07-0	1,2-Dichloroethane-D4	108%		68-124%
2037-26-5	Toluene-D8	105%		80-119%
460-00-4	4-Bromofluorobenzene	105%		72-126%

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	WW14A-HUR-120212	<b>Date Sampled:</b>	12/02/12
<b>Lab Sample ID:</b>	TC20883-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	RSKSOP-147/175		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	SS005076.D	1	12/07/12	LT	n/a	n/a	GSS233
Run #2	SS005100.D	10	12/10/12	LT	n/a	n/a	GSS234

## RSK147 Special List

CAS No.	Compound	Result	MQL	SDL	Units	Q
74-82-8	Methane	0.699 <sup>a</sup>	0.0050	0.0030	mg/l	
74-85-1	Ethene	0.00050 U	0.0010	0.00050	mg/l	
74-84-0	Ethane	0.0705	0.0010	0.00050	mg/l	
74-98-6	Propane	0.00075 U	0.0015	0.00075	mg/l	
75-28-5	Isobutane	0.00075 U	0.0015	0.00075	mg/l	
106-97-8	Butane	0.00075 U	0.0015	0.00075	mg/l	

(a) Result is from Run# 2

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Misc. Forms

5

### Custody Documents and Other Forms

---

Includes the following where applicable:

- Chain of Custody
- LRC Form



**Accutest Job Number:** TC20883      **Client:** EARTHCON CONSULTANTS      **Project:** 3RD QTR WELL SAMPLING,PARKER COUNTY,T  
**Date / Time Received:** 12/4/2012      **Delivery Method:** Client      **Airbill #'s:** \_\_\_\_\_  
**No. Coolers:** 1      **Therm ID:** IR6      **Temp Adjustment Factor:** 0.2  
**Cooler Temps (Initial/Adjusted):** #1: (2.2/2.4)

<b>Cooler Security</b>		<b>Y or N</b>		<b>Y or N</b>	
1. Custody Seals Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Cooler Temperature</b>		<b>Y or N</b>			
1. Temp criteria achieved:	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
2. Cooler temp verification:	Infrared Gun				
3. Cooler media:	Ice (bag)				
<b>Quality Control Preservation</b>	<b>Y</b>	<b>or</b>	<b>N</b>	<b>N/A</b>	<b>WTB STB</b>
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. Trip Blank listed on COC:	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Samples preserved properly:	<input checked="" type="checkbox"/>		<input type="checkbox"/>		
4. VOCs headspace free:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	

<b>Sample Integrity - Documentation</b>	<b>Y</b>	<b>or</b>	<b>N</b>
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
<b>Sample Integrity - Condition</b>	<b>Y</b>	<b>or</b>	<b>N</b>
1. Sample recvd within HT:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Condition of sample:	Intact		
<b>Sample Integrity - Instructions</b>	<b>Y</b>	<b>or</b>	<b>N</b>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Bottles received for unspecified tests	<input type="checkbox"/>		<input checked="" type="checkbox"/>
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
4. Compositing instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>		<input checked="" type="checkbox"/>

Comments -Received trip blank not listed on COC.

**Accutest Job Number:** TC20883

**CSR:** Elessa Sommers

**Response Date:** 12/5/2012

**Response:** Trip blank is on separate report.

5.1

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**TC20883: Chain of Custody**  
**Page 3 of 4**

## Sample Receipt Log

Page 3 of 3

**Job #:** TC20883

**Date / Time Received:** 12/4/2012 9:22:00 AM

**Initials:** CH

**Client:** EARTHCON CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	pH	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20883-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20883-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20883-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20883-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20883-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20883-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4

 5.1  
5

**TC20883: Chain of Custody**
**Page 4 of 4**

# Appendix A Laboratory Data Package Cover Page

TC20883 This data package consists of

- ☐ This signature page, the laboratory review checklist, and the following reportable data:
- ☐ R1 Field chain-of-custody documentation;
- ☐ R2 Sample identification cross-reference;
- ☐ R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - a) Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
  - b) dilution factors,
  - c) preparation methods,
  - d) cleanup methods, and
  - e) if required for the project, tentatively identified compounds (TICs).
- ☐ R4 Surrogate recovery data including:
  - a) Calculated recovery (%R), and
  - b) The laboratory's surrogate QC limits.
- ☐ R5 Test reports/summary forms for blank samples;
- ☐ R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - a) LCS spiking amounts,
  - b) Calculated %R for each analyte, and
  - c) The laboratory's LCS QC limits.
- ☐ R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - a) Samples associated with the MS/MSD clearly identified,
  - b) MS/MSD spiking amounts,
  - c) Concentration of each MS/MSD analyte measured in the parent and
  - d) Calculated %Rs and relative percent differences (RPDs), and
  - e) The laboratory's MS/MSD QC limits
- ☐ R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - a) The amount of analyte measured in the duplicate,
  - b) The calculated RPD, and
  - c) The laboratory's QC limits for analytical duplicates.
- ☐ R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each
- ☐ R10 Other problems or anomalies.


The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

**Release Statement:** I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Report. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld.

**Check, if applicable:** This laboratory meets an exception under 30 TAC&25.6 and was last inspection by

☐ [X] TCEQ or ☐ \_\_\_\_\_ on April 2011. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

## QA Manager

Name (Printed)	Signature	Official Title (printed)	Date
Richard Rodriguez		Laboratory Director	12/12/2012
_____	_____	_____	_____



LABORATORY REVIEW CHECKLIST: REPORTABLE DATA									
Laboratory Name:		Accutest Gulf Coast		LRC Date:		12/12/2012			
Project Name:		Quarterly Well Sampling, Parker County, Texas		Laboratory Project Number:		TC20883			
Reviewer Name:		Anita Patel		Prep Batch Number(s):		GSS233, VK578			
# <sup>1</sup>	A <sup>2</sup>	DESCRIPTION				YES	NO	NA <sup>3</sup>	NR <sup>4</sup>   ER # <sup>5</sup>
R1	OI	<b>CHAIN-OF-CUSTODY (C-O-C):</b>							
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?				X			
		Were all departures from standard conditions described in an exception report?				X			
R2	OI	<b>Sample and quality control (QC) identification</b>							
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?				X			
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?				X			
R3	OI	<b>Test reports</b>							
		Were samples prepared and analyzed within holding times?				X			
		Other than those results <MQL, were all other raw values bracketed by calibration standards?				X			
		Were calculations checked by a peer or supervisor?				X			
		Were all analyte identifications checked by a peer or supervisor?				X			
		Were sample detection limits reported for all analytes not detected?				X			
		Were all results for soil and sediment samples reported on a dry weight basis?						X	
		Were % moisture (or solids) reported for all soil and sediment samples?						X	
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?						X	
		If required for the project, are TIC's reported?						X	
R4	O	<b>Surrogate recovery data</b>							
		Were surrogates added prior to extraction?				X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?				X			
R5	OI	<b>Test reports/summary forms for blank samples</b>							
		Were appropriate type(s) of blanks analyzed?				X			
		Were blanks analyzed at the appropriate frequency?				X			
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?				X			
		Were blank concentrations <MQL?				X			
R6	OI	<b>Laboratory control samples (LCS):</b>							
		Were all COCs included in the LCS?				X			
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?				X			
		Were LCSs analyzed at required frequency?				X			
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?				X			
		Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?				X			4
		Was the LCSD RPD within QC limits?						X	
R7	OI	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>							
		Were the project/method specified analytes included in the MS and MSD?				X			
		Were MS/MSD analyzed at the appropriate frequency?				X			
		Were MS (and MSD, if applicable) %Rs within the laboratory QC Limits?				X			
		Were the MS/MSD RPDs within laboratory QC limits?				X			
R8	OI	<b>Analytical duplicate data</b>							
		Were appropriate analytical duplicates analyzed for each matrix?				X			
		Were analytical duplicates analyzed at the appropriate frequency?				X			
		Were RPDs or relative standard deviations within the laboratory QC limits?				X			
R9	OI	<b>Method quantitation limits (MQLs):</b>							
		Are the MQLs for each method analyte included in the laboratory data package?				X			
		Do the MQLs correspond to the concentration of the lowest non-zero calibration				X			
		Are unadjusted MQLs and DCSSs included in the laboratory data package?					X		2
R10	OI	<b>Other problems/anomalies</b>							
		Are all known problems/anomalies/special conditions noted in this LRC and ER?				X			
		Was applicable and available technology used to lower the SDL to minimize the				X			
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package?				X			3

Laboratory Name:		Accutest Gulf Coast	LRC Date:		12/12/2012	
Project Name:		Quarterly Well Sampling, Parker	Laboratory Project Number:		TC20883	
Reviewer Name:		Anita Patel	Prep Batch Number(s):		GSS233, VK578	
# <sup>1</sup>	A <sup>2</sup>	DESCRIPTION	YES	NO	NA <sup>3</sup>	NR <sup>4</sup> ER # <sup>5</sup>
S1	OI	<b>Initial calibration (ICAL)</b>				
		Were response factors and/or relative response factors for each analyte within QC limits?	X			
		Were percent RSDs or correlation coefficient criteria met?	X			
		Was the number of standards recommended in the method used for all analytes?	X			
		Were all points generated between the lowest and highest standard used to calculate the curve?	X			
		Are ICAL data available for all instruments used?	X			
		Has the initial calibration curve been verified using an appropriate second source standard?	X			
S2	OI	<b>Initial and continuing calibration verification (ICCV AND CCV) and continuing</b>				
		Was the CCV analyzed at the method-required frequency?	X			
		Were percent differences for each analyte within the method-required QC limits?	X			
		Was the ICAL curve verified for each analyte?	X			
		Was the absolute value of the analyte concentration in the inorganic CCB<MDL?			X	
S3	O	<b>Mass spectral tuning</b>				
		Was the appropriate compound for the method used for tuning?	X			
		Were ion abundance data within the method-required QC limits?	X			
S4	O	<b>Internal standards (IS)</b>				
		Were IS area counts and retention times within the method-required QC limits?	X			
S5	OI	<b>Raw data (NELAC Section 5.5.10)</b>				
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X			
		Were data associated with manual integrations flagged on the raw data?	X			
S6	O	<b>Dual column confirmation</b>				
		Did dual column confirmation results meet the method-required QC?			X	
S7	O	<b>Tentatively identified compounds (TICs):</b>				
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X	
S8	I	<b>Interference Check Sample (ICS) results</b>				
		Were percent recoveries within method QC limits?			X	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>				
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X	
S10	OI	<b>Method detection limit (MDL) studies</b>				
		Was a MDL study performed for each reported analyte?	X			
		Is the MDL either adjusted or supported by the analysis of DCSSs?	X			4
S11	OI	<b>Proficiency test reports</b>				
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X			
S12	OI	<b>Standards documentation</b>				
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate source?	X			
S13	OI	<b>Compound/analyte identification procedures</b>				
		Are the procedures for compound/analyte identification documented?	X			
S14	OI	<b>Demonstration of analyst competency (DOC)</b>				
		Was DOC conducted consistent with NELAC Chapter 5?	X			
		Is documentation of the analyst's competency up-to-date and on file?	X			
S15	OI	<b>Verification/validation documentation for methods (NELAC Chapter 5)</b>				
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X			
S16	OI	<b>Laboratory standard operating procedures (SOPs)</b>				
		Are laboratory SOPs current and on file for each method performed?	X			

LABORATORY REVIEW CHECKLIST (continued): Exception Reports			
Laboratory Name:		Accutest Gulf Coast	LRC Date:
Project Name:		Quarterly Well Sampling, Parker	12/12/2012
Reviewer Name:		Anita Patel	Laboratory Project Number:
			TC20883
		Prep Batch Number(s):	GSS233, VK578
ER#	Description		
1	For reporting purposes, the MQL is defined in the report as the RL. The unadjusted MQL/RL is reported in the method blank. The SDL is defined in the report as the MDL.		
2	For reporting purposes, the method blank represents the unadjusted MQL. The DCS is on file in the laboratory and is not included in the laboratory data package.		
3	The laboratory is NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package for analytes that are listed in the Texas Fields of Accreditation.		
4	The laboratory does not perform DCS analysis for Method RSKSOP-147/175. The components reported are not listed or do not have values in the Texas TRRP PCL tables.		

1ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on

## GC/MS Volatiles

### QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** TC20883

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VK578-MB	K13177.D	1	12/06/12	EM	n/a	n/a	VK578

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20883-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.34	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l	
108-88-3	Toluene	ND	1.0	0.33	ug/l	
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	107% 72-122%
17060-07-0	1,2-Dichloroethane-D4	105% 68-124%
2037-26-5	Toluene-D8	107% 80-119%
460-00-4	4-Bromofluorobenzene	103% 72-126%

## Blank Spike Summary

Page 1 of 1

**Job Number:** TC20883

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VK578-BS	K13175.D	1	12/06/12	EM	n/a	n/a	VK578

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20883-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	23.5	94	68-119
100-41-4	Ethylbenzene	25	23.4	94	71-117
108-88-3	Toluene	25	23.0	92	73-119
1330-20-7	Xylene (total)	75	71.7	96	74-119

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	103%	68-124%
2037-26-5	Toluene-D8	105%	80-119%
460-00-4	4-Bromofluorobenzene	101%	72-126%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** TC20883

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20506-1MS	K13179.D	1	12/06/12	EM	n/a	n/a	VK578
TC20506-1MSD	K13180.D	1	12/06/12	EM	n/a	n/a	VK578
TC20506-1	K13178.D	1	12/06/12	EM	n/a	n/a	VK578

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20883-1

CAS No.	Compound	TC20506-1 ug/l	Spike Q ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	25	23.4	94	23.1	92	1	68-119/12
100-41-4	Ethylbenzene	ND	25	22.9	92	22.6	90	1	71-117/12
108-88-3	Toluene	ND	25	23.0	92	22.1	88	4	73-119/13
1330-20-7	Xylene (total)	ND	75	71.6	95	69.3	92	3	74-119/13

CAS No.	Surrogate Recoveries	MS	MSD	TC20506-1	Limits
1868-53-7	Dibromofluoromethane	108%	108%	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	103%	105%	104%	68-124%
2037-26-5	Toluene-D8	107%	105%	106%	80-119%
460-00-4	4-Bromofluorobenzene	103%	104%	104%	72-126%

\* = Outside of Control Limits.

## GC Volatiles

## QC Data Summaries

---

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



## Method Blank Summary

Page 1 of 1

**Job Number:** TC20883

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS233-MB	SS005056.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20883-1

CAS No.	Compound	Result	RL	MDL	Units	Q
74-85-1	Ethene	ND	1.0	0.50	ug/l	
74-84-0	Ethane	ND	1.0	0.50	ug/l	
74-98-6	Propane	ND	1.5	0.75	ug/l	
75-28-5	Isobutane	ND	1.5	0.75	ug/l	
106-97-8	Butane	ND	1.5	0.75	ug/l	

Method Blank Summary

Job Number: TC20883  
Account: PESTXST EarthCon Consultants  
Project: Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS234-MB	SS005099.D	1	12/10/12	LT	n/a	n/a	GSS234

The QC reported here applies to the following samples: Method: RSKSOP-147/175

TC20883-1

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	ND	0.50	0.30	ug/l	

7.1.2  
7

## Blank Spike Summary

Page 1 of 1

**Job Number:** TC20883

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS233-BS	SS005054.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20883-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-85-1	Ethene	57.4	43.2	75	52-145
74-84-0	Ethane	43.3	47.1	109	68-131
74-98-6	Propane	60.6	60.5	100	69-131
75-28-5	Isobutane	72.5	70.4	97	72-131
106-97-8	Butane	76.6	73.6	96	66-128

\* = Outside of Control Limits.

Blank Spike Summary

Job Number: TC20883  
Account: PESTXST EarthCon Consultants  
Project: Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS234-BS	SS005096.D	1	12/10/12	LT	n/a	n/a	GSS234

The QC reported here applies to the following samples: Method: RSKSOP-147/175

TC20883-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	21.5	20.9	97	68-139

\* = Outside of Control Limits.

## Matrix Spike Summary

Page 1 of 1

**Job Number:** TC20883

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20970-2MS <sup>a</sup>	SS005067.D	1	12/07/12	LT	n/a	n/a	GSS233
TC20970-2 <sup>a</sup>	SS005066.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20883-1

CAS No.	Compound	TC20970-2 ug/l	Spike Q ug/l	MS ug/l	MS %	Limits
74-85-1	Ethene	ND	57.4	46.6	81	52-145
74-84-0	Ethane	4.71	43.3	46.7	97	68-131
74-98-6	Propane	ND	60.6	53.4	88	69-131
75-28-5	Isobutane	ND	72.5	61.8	85	72-131
106-97-8	Butane	ND	76.6	66.0	86	66-128

(a) Sample was not preserved to a pH < 2.

\* = Outside of Control Limits.

Matrix Spike Summary

Job Number: TC20883  
Account: PESTXST EarthCon Consultants  
Project: Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC21021-2MS	SS005113.D	1	12/10/12	LT	n/a	n/a	GSS234
TC21021-2	SS005112.D	1	12/10/12	LT	n/a	n/a	GSS234

The QC reported here applies to the following samples: Method: RSKSOP-147/175

TC20883-1

CAS No.	Compound	TC21021-2 ug/l	Spike Q ug/l	MS ug/l	MS %	Limits
74-82-8	Methane	1.49	21.5	24.3	106	68-139

\* = Outside of Control Limits.

## Duplicate Summary

Page 1 of 1

**Job Number:** TC20883

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20879-1DUP	SS005062.D	1	12/07/12	LT	n/a	n/a	GSS233
TC20879-1	SS005061.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20883-1

CAS No.	Compound	TC20879-1	DUP	Q	RPD	Limits
		ug/l	Q ug/l			
74-85-1	Ethene	1.0 U	ND		nc	27
74-84-0	Ethane	1.0 U	ND		nc	43
74-98-6	Propane	1.5 U	ND		nc	21
75-28-5	Isobutane	1.5 U	ND		nc	35
106-97-8	Butane	1.5 U	ND		nc	33

\* = Outside of Control Limits.

## Duplicate Summary

Page 1 of 1

**Job Number:** TC20883

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC21021-1DUP	SS005111.D	1	12/10/12	LT	n/a	n/a	GSS234
TC21021-1	SS005110.D	1	12/10/12	LT	n/a	n/a	GSS234

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20883-1

CAS No.	Compound	TC21021-1		DUP		Q	RPD	Limits
		ug/l	Q	ug/l	Q			
74-82-8	Methane	0.88		0.86			2	53

\* = Outside of Control Limits.



Lab #: 321089 Job #: 20030  
 Sample Name/Number: WW14A-Hur-120212  
 Company: Oil Tracers, LLC  
 Date Sampled: 12/02/2012  
 Container: Dissolved Gas Bottle  
 Field/Site Name: Third Quarter Well Sampling  
 Location: Parker County, Texas  
 Formation/Depth:  
 Sampling Point:  
 Date Received: 12/05/2012 Date Reported: 2/01/2013

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{18}\text{O}$ ‰
Carbon Monoxide -----	nd			
Hydrogen Sulfide -----	na			
Helium -----	na			
Hydrogen -----	nd			
Argon -----	1.52			
Oxygen -----	0.11			
Nitrogen -----	84.47			
Carbon Dioxide -----	0.39			
Methane -----	13.22	-42.45	-132.0	
Ethane -----	0.288	-25.0		
Ethylene -----	nd			
Propane -----	nd			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	0.0004			
Iso-pentane -----	0.0009			
N-pentane -----	nd			
Hexanes + -----	nd			

**Remarks:**

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.76

\*Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

\*\* Ethane isotopes obtained online via GC-C-IRMS

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.



12/12/12

## Technical Report for

EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW15-Hur

Accutest Job Number: TC20887

Sampling Date: 12/02/12


Report to:

EarthCon Consultants  
4800 Sugar Grove Suite 420  
Stafford, TX 77477  
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mcpatton@rangeresources.com; escott@earthcon.com  
ATTN: Gabriela Floreslovo

Total number of pages in report: **26**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

  
Richard Rodriguez  
Laboratory Director

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366)  
LA (85695/04004) OK (211-035)

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Test results relate only to samples analyzed.

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Sample Summary

EarthCon Consultants

Job No: TC20887

Quarterly Well Sampling, Parker County, Texas  
Project No: 3rd Quarter / WW15-Hur

Sample Number	Collected		Matrix			Client Sample ID
	Date	Time By	Received	Code	Type	
TC20887-1	12/02/12	11:28	12/04/12	AQ	Ground Water	WW15-HUR-120212



## SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** EarthCon Consultants

**Job No** TC20887

**Site:** Quarterly Well Sampling, Parker County, Texas

**Report Date** 12/12/2012 8:56:23 AM

1 Sample was collected on 12/02/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20887. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### Volatiles by GCMS By Method SW846 8260B

**Matrix** AQ

**Batch ID:** VZ3820

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20772-2MS, TC20772-2MSD were used as the QC samples indicated.

### Volatiles by GC By Method RSKSOP-147/175

**Matrix** AQ

**Batch ID:** GSS234

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC21021-1DUP, TC21021-2MS were used as the QC samples indicated.
- Matrix Spike Recovery for Ethane is outside control limits. Probable cause due to matrix interference.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used

Summary of Hits

**Job Number:** TC20887  
**Account:** EarthCon Consultants  
**Project:** Quarterly Well Sampling, Parker County, Texas  
**Collected:** 12/02/12



Lab Sample ID	Client Sample ID	Result/ Analyte	Qual	MQL	SDL	Units	Method
TC20887-1	WW15-HUR-120212						
		Methane	5.32	0.025	0.015	mg/l	RSKSOP-147/175
		Ethane	0.231	0.0010	0.00050	mg/l	RSKSOP-147/175

Sample Results

Report of Analysis

## Report of Analysis

<b>Client Sample ID:</b>	WW15-HUR-120212	<b>Date Sampled:</b>	12/02/12
<b>Lab Sample ID:</b>	TC20887-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	Z030548.D	1	12/06/12	EM	n/a	n/a	VZ3820
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

## Purgeable Aromatics

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2	Benzene	0.00034 U	0.0010	0.00034	mg/l	
108-88-3	Toluene	0.00033 U	0.0010	0.00033	mg/l	
100-41-4	Ethylbenzene	0.00032 U	0.0010	0.00032	mg/l	
1330-20-7	Xylene (total)	0.00087 U	0.0030	0.00087	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	94%		72-122%
17060-07-0	1,2-Dichloroethane-D4	83%		68-124%
2037-26-5	Toluene-D8	90%		80-119%
460-00-4	4-Bromofluorobenzene	94%		72-126%

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound



## Report of Analysis

<b>Client Sample ID:</b>	WW15-HUR-120212	<b>Date Sampled:</b>	12/02/12
<b>Lab Sample ID:</b>	TC20887-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	RSKSOP-147/175		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	SS005107.D	1	12/10/12	LT	n/a	n/a	GSS234
Run #2	SS005109.D	50	12/10/12	LT	n/a	n/a	GSS234

## RSK147 Special List

CAS No.	Compound	Result	MQL	SDL	Units	Q
74-82-8	Methane	5.32 <sup>a</sup>	0.025	0.015	mg/l	
74-85-1	Ethene	0.00050 U	0.0010	0.00050	mg/l	
74-84-0	Ethane	0.231	0.0010	0.00050	mg/l	
74-98-6	Propane	0.00075 U	0.0015	0.00075	mg/l	
75-28-5	Isobutane	0.00075 U	0.0015	0.00075	mg/l	
106-97-8	Butane	0.00075 U	0.0015	0.00075	mg/l	

(a) Result is from Run# 2

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Misc. Forms

5

### Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody
- LRC Form



## CHAIN OF CUSTODY

PAGE 1 OF 1

10165 Harwin Dr, Ste 150 Houston, TX 77036  
TEL: 713-271-4700 FAX: 713-271-4770  
www.accutest.com

FED-EX Tracking #		Bottle Order Control #	
Accutest Quote #		Accutest Job # <b>TC20887</b>	
Client / Reporting Information		Project Information	
Company Name <b>EarthCon Consultants, Inc.</b>		Project Name <b>Third Quarterly Well Sampling, Parker County, Texas</b>	
Street Address <b>4800 Sugar Grove Blvd., Suite 390</b>		Street	
City State Zip <b>Stafford TX 77477</b>		City State	
Project Contact <b>Gabriela Floreslovo</b>		Billing Information (if different from Report to) Company Name	
Phone # <b>281-201-3513</b>		Street Address	
Fax #		City State Zip	
Sampler(s) Name(s) <b>JB, SH, RM</b>		Project Manager	
Phone #		Attention:	
Field ID / Point of Collection <b>WW15-Hur-120212</b>		Collection	
Date <b>12/2/12</b>		Time <b>1128</b>	
Sampled By <b>JB</b>		Matrix <b>6</b>	
# of bottles <b>6</b>		Number of preserved bottles	
HC		NaOH	
ZnAcOH		HNO3	
H2SO4		NONE	
DI Water		MECH	
TSP		NaHSO4	
ENCORE		OTHER	
BTX 6260B		Butane, Ethane, Ethene, Isobutane, Methane, Propane by RSK-175	
LAB USE ONLY		Matrix Codes	
		DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WIP - Wipe FB - Field Blank	
Turnaround Time (Business days)		Data Deliverable Information	
<input checked="" type="checkbox"/> Standard <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 4 Day RUSH <input type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day EMERGENCY Emergency & Rush T/A data available VIA Lablink		Approved By (Accutest PM): / Date: <b>0922</b>	
<input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> FULT1 (Level 3+4) <input type="checkbox"/> REDT1 (Level 3+4) <input type="checkbox"/> Commercial "C"		<input checked="" type="checkbox"/> TRRP <input type="checkbox"/> EDD Format <input type="checkbox"/> Other	
Commercial "A" = Results Only Commercial "B" = Results + QC Summary Commercial "C" = Results + QC & Surrogate Summary			
Relinquished by Sampler: <b>3</b>		Date Time: <b>12/2/12 1542</b>	
Relinquished by Sampler: <b>3</b>		Received By: <b>3</b>	
Relinquished by: <b>5</b>		Date Time:	
Relinquished By: <b>2</b>		Date Time:	
Relinquished By: <b>4</b>		Date Time:	
Custody Seal #		Intact <input type="checkbox"/> Not Intact <input type="checkbox"/>	
Preserved where applicable <input type="checkbox"/>		On Ice <input type="checkbox"/>	
Cooler Temp.			

TC20887: Chain of Custody

Page 1 of 4

**Accutest Job Number:** TC20887      **Client:** EARTHCON CONSULTANTS      **Project:** 3RD QTR WELL SAMPLING, PARKER COUNTY, T  
**Date / Time Received:** 12/4/2012      **Delivery Method:** Client      **Airbill #s:** \_\_\_\_\_  
**No. Coolers:** 1      **Therm ID:** IR6      **Temp Adjustment Factor:** 0.2  
**Cooler Temps (Initial/Adjusted):** #1: (2.2/2.4)

<b>Cooler Security</b>		<b>Y or N</b>		<b>Y or N</b>	
1. Custody Seals Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Cooler Temperature</b>		<b>Y or N</b>			
1. Temp criteria achieved:	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
2. Cooler temp verification:	_____				
3. Cooler media:	_____				
<b>Quality Control Preservation</b>	<b>Y</b>	<b>or</b>	<b>N</b>	<b>N/A</b>	<b>WTB STB</b>
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. Trip Blank listed on COC:	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Samples preserved properly:	<input checked="" type="checkbox"/>		<input type="checkbox"/>		
4. VOCs headspace free:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	

<b>Sample Integrity - Documentation</b>	<b>Y</b>	<b>or</b>	<b>N</b>
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Sample container label / COC agree:	<input type="checkbox"/>		<input checked="" type="checkbox"/>
<b>Sample Integrity - Condition</b>	<b>Y</b>	<b>or</b>	<b>N</b>
1. Sample recvd within HT:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Condition of sample:	Intact		
<b>Sample Integrity - Instructions</b>	<b>Y</b>	<b>or</b>	<b>N</b>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Bottles received for unspecified tests	<input type="checkbox"/>		<input checked="" type="checkbox"/>
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
4. Compositing instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>		<input checked="" type="checkbox"/>

Comments -Received trip blank not listed on COC.  
 - Two of six vial labels list "WW12-HUR-120212" as sample ID, time/date match COC.

**Accutest Job Number:** TC20887

**CSR:** Elessa Sommers

**Response Date:** 12/5/2012

**Response:** Trip blank is on separate report.

5.1

5

**TC20887: Chain of Custody**  
**Page 3 of 4**

# Sample Receipt Log

**Job #:** TC20887

**Date / Time Received:** 12/4/2012 9:22:00 AM

**Initials:** CH

**Client:** EARTHCON CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	pH	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20887-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20887-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20887-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20887-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20887-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20887-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4

5.1  
5

**TC20887: Chain of Custody**

**Page 4 of 4**

# Appendix A Laboratory Data Package Cover Page

TC20887 This data package consists of

- ☐ This signature page, the laboratory review checklist, and the following reportable data:
- ☐ R1 Field chain-of-custody documentation;
- ☐ R2 Sample identification cross-reference;
- ☐ R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - a) Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
  - b) dilution factors,
  - c) preparation methods,
  - d) cleanup methods, and
  - e) if required for the project, tentatively identified compounds (TICs).
- ☐ R4 Surrogate recovery data including:
  - a) Calculated recovery (%R), and
  - b) The laboratory's surrogate QC limits.
- ☐ R5 Test reports/summary forms for blank samples;
- ☐ R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - a) LCS spiking amounts,
  - b) Calculated %R for each analyte, and
  - c) The laboratory's LCS QC limits.
- ☐ R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - a) Samples associated with the MS/MSD clearly identified,
  - b) MS/MSD spiking amounts,
  - c) Concentration of each MS/MSD analyte measured in the parent and
  - d) Calculated %Rs and relative percent differences (RPDs), and
  - e) The laboratory's MS/MSD QC limits
- ☐ R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - a) The amount of analyte measured in the duplicate,
  - b) The calculated RPD, and
  - c) The laboratory's QC limits for analytical duplicates.
- ☐ R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each
- ☐ R10 Other problems or anomalies.


The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

**Release Statement:** I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Report. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld.

**Check, if applicable:** This laboratory meets an exception under 30 TAC&25.6 and was last inspection by

[ ] [X] TCEQ or [ ] \_\_\_\_\_ on April 2011. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

## QA Manager

Name (Printed)	Signature	Official Title (printed)	Date
Richard Rodriguez		Laboratory Director	12/12/2012
_____	_____	_____	_____

LABORATORY REVIEW CHECKLIST: REPORTABLE DATA									
Laboratory Name:		Accutest Gulf Coast		LRC Date:		12/12/2012			
Project Name:		Quarterly Well Sampling, Parker County, Texas		Laboratory Project Number:		TC20887			
Reviewer Name:		Anita Patel		Prep Batch Number(s):		GSS234, VZ3820			
# <sup>1</sup>	A <sup>2</sup>	DESCRIPTION				YES	NO	NA <sup>3</sup>	NR <sup>4</sup> ER # <sup>5</sup>
R1	OI	<b>CHAIN-OF-CUSTODY (C-O-C):</b>							
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?				X			
		Were all departures from standard conditions described in an exception report?				X			
R2	OI	<b>Sample and quality control (QC) identification</b>							
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?				X			
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?				X			
R3	OI	<b>Test reports</b>							
		Were samples prepared and analyzed within holding times?				X			
		Other than those results <MQL, were all other raw values bracketed by calibration standards?				X			
		Were calculations checked by a peer or supervisor?				X			
		Were all analyte identifications checked by a peer or supervisor?				X			
		Were sample detection limits reported for all analytes not detected?				X			
		Were all results for soil and sediment samples reported on a dry weight basis?						X	
		Were % moisture (or solids) reported for all soil and sediment samples?						X	
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?						X	
		If required for the project, are TIC's reported?						X	
R4	O	<b>Surrogate recovery data</b>							
		Were surrogates added prior to extraction?				X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?				X			
R5	OI	<b>Test reports/summary forms for blank samples</b>							
		Were appropriate type(s) of blanks analyzed?				X			
		Were blanks analyzed at the appropriate frequency?				X			
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?				X			
		Were blank concentrations <MQL?				X			
R6	OI	<b>Laboratory control samples (LCS):</b>							
		Were all COCs included in the LCS?				X			
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?				X			
		Were LCSs analyzed at required frequency?				X			
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?				X			
		Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?				X			5
		Was the LCSD RPD within QC limits?						X	
R7	OI	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>							
		Were the project/method specified analytes included in the MS and MSD?				X			
		Were MS/MSD analyzed at the appropriate frequency?				X			
		Were MS (and MSD, if applicable) %Rs within the laboratory QC Limits?					X		4
		Were the MS/MSD RPDs within laboratory QC limits?				X			
R8	OI	<b>Analytical duplicate data</b>							
		Were appropriate analytical duplicates analyzed for each matrix?				X			
		Were analytical duplicates analyzed at the appropriate frequency?				X			
		Were RPDs or relative standard deviations within the laboratory QC limits?				X			
R9	OI	<b>Method quantitation limits (MQLs):</b>							
		Are the MQLs for each method analyte included in the laboratory data package?				X			
		Do the MQLs correspond to the concentration of the lowest non-zero calibration				X			
		Are unadjusted MQLs and DCs included in the laboratory data package?					X		2
R10	OI	<b>Other problems/anomalies</b>							
		Are all known problems/anomalies/special conditions noted in this LRC and ER?				X			
		Was applicable and available technology used to lower the SDL to minimize the				X			
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package?				X			3



Laboratory Name:		Accutest Gulf Coast	LRC Date:		12/12/2012	
Project Name:		Quarterly Well Sampling, Parker	Laboratory Project Number:		TC20887	
Reviewer Name:		Anita Patel	Prep Batch Number(s):		GSS234, VZ3820	
# <sup>1</sup>	A <sup>2</sup>	DESCRIPTION	YES	NO	NA <sup>3</sup>	NR <sup>4</sup> ER # <sup>5</sup>
S1	OI	<b>Initial calibration (ICAL)</b>				
		Were response factors and/or relative response factors for each analyte within QC limits?	X			
		Were percent RSDs or correlation coefficient criteria met?	X			
		Was the number of standards recommended in the method used for all analytes?	X			
		Were all points generated between the lowest and highest standard used to calculate the curve?	X			
		Are ICAL data available for all instruments used?	X			
		Has the initial calibration curve been verified using an appropriate second source standard?	X			
S2	OI	<b>Initial and continuing calibration verification (ICCV AND CCV) and continuing</b>				
		Was the CCV analyzed at the method-required frequency?	X			
		Were percent differences for each analyte within the method-required QC limits?	X			
		Was the ICAL curve verified for each analyte?	X			
		Was the absolute value of the analyte concentration in the inorganic CCB<MDL?			X	
S3	O	<b>Mass spectral tuning</b>				
		Was the appropriate compound for the method used for tuning?	X			
		Were ion abundance data within the method-required QC limits?	X			
S4	O	<b>Internal standards (IS)</b>				
		Were IS area counts and retention times within the method-required QC limits?	X			
S5	OI	<b>Raw data (NELAC Section 5.5.10)</b>				
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X			
		Were data associated with manual integrations flagged on the raw data?	X			
S6	O	<b>Dual column confirmation</b>				
		Did dual column confirmation results meet the method-required QC?			X	
S7	O	<b>Tentatively identified compounds (TICs):</b>				
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X	
S8	I	<b>Interference Check Sample (ICS) results</b>				
		Were percent recoveries within method QC limits?			X	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>				
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X	
S10	OI	<b>Method detection limit (MDL) studies</b>				
		Was a MDL study performed for each reported analyte?	X			
		Is the MDL either adjusted or supported by the analysis of DCSs?	X			5
S11	OI	<b>Proficiency test reports</b>				
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X			
S12	OI	<b>Standards documentation</b>				
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate source?	X			
S13	OI	<b>Compound/analyte identification procedures</b>				
		Are the procedures for compound/analyte identification documented?	X			
S14	OI	<b>Demonstration of analyst competency (DOC)</b>				
		Was DOC conducted consistent with NELAC Chapter 5?	X			
		Is documentation of the analyst's competency up-to-date and on file?	X			
S15	OI	<b>Verification/validation documentation for methods (NELAC Chapter 5)</b>				
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X			
S16	OI	<b>Laboratory standard operating procedures (SOPs)</b>				
		Are laboratory SOPs current and on file for each method performed?	X			

LABORATORY REVIEW CHECKLIST (continued): Exception Reports			
Laboratory Name:	Accutest Gulf Coast	LRC Date:	12/12/2012
Project Name:	Quarterly Well Sampling, Parker	Laboratory Project Number:	TC20887
Reviewer Name:	Anita Patel	Prep Batch Number(s):	GSS234, VZ3820
ER# <sup>1</sup>	Description		
1	For reporting purposes, the MQL is defined in the report as the RL. The unadjusted MQL/RL is reported in the method blank. The SDL is defined in the report as the MDL.		
2	For reporting purposes, the method blank represents the unadjusted MQL. The DCS is on file in the laboratory and is not included in the laboratory data package.		
3	The laboratory is NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package for analytes that are listed in the Texas Fields of Accreditation.		
4	All anomalies are discussed in the case narrative.		
5	The laboratory does not perform DCS analysis for Method RSKSOP-147/175. The components reported are not listed or do not have values in the Texas TRRP PCL tables.		

1ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on

## GC/MS Volatiles

### QC Data Summaries

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Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** TC20887

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VZ3820-MB	Z030534.D	1	12/06/12	EM	n/a	n/a	VZ3820

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20887-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.34	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l	
108-88-3	Toluene	ND	1.0	0.33	ug/l	
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	95% 72-122%
17060-07-0	1,2-Dichloroethane-D4	86% 68-124%
2037-26-5	Toluene-D8	88% 80-119%
460-00-4	4-Bromofluorobenzene	93% 72-126%

## Blank Spike Summary

Page 1 of 1

**Job Number:** TC20887

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VZ3820-BS	Z030532.D	1	12/06/12	EM	n/a	n/a	VZ3820

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20887-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	20.7	83	68-119
100-41-4	Ethylbenzene	25	20.6	82	71-117
108-88-3	Toluene	25	20.8	83	73-119
1330-20-7	Xylene (total)	75	64.2	86	74-119

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	92%	72-122%
17060-07-0	1,2-Dichloroethane-D4	84%	68-124%
2037-26-5	Toluene-D8	91%	80-119%
460-00-4	4-Bromofluorobenzene	91%	72-126%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** TC20887

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20772-2MS	Z030536.D	1	12/06/12	EM	n/a	n/a	VZ3820
TC20772-2MSD	Z030537.D	1	12/06/12	EM	n/a	n/a	VZ3820
TC20772-2	Z030535.D	1	12/06/12	EM	n/a	n/a	VZ3820

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20887-1

CAS No.	Compound	TC20772-2 ug/l	Spike Q ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	25	21.6	86	20.6	82	5	68-119/12
100-41-4	Ethylbenzene	ND	25	21.4	86	20.9	84	2	71-117/12
108-88-3	Toluene	ND	25	20.5	82	20.5	82	0	73-119/13
1330-20-7	Xylene (total)	ND	75	68.6	91	64.8	86	6	74-119/13

CAS No.	Surrogate Recoveries	MS	MSD	TC20772-2	Limits
1868-53-7	Dibromofluoromethane	94%	93%	99%	72-122%
17060-07-0	1,2-Dichloroethane-D4	83%	84%	87%	68-124%
2037-26-5	Toluene-D8	86%	89%	89%	80-119%
460-00-4	4-Bromofluorobenzene	89%	91%	94%	72-126%

\* = Outside of Control Limits.

## GC Volatiles

## QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** TC20887

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS234-MB	SS005099.D	1	12/10/12	LT	n/a	n/a	GSS234

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20887-1

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	ND	0.50	0.30	ug/l	
74-85-1	Ethene	ND	1.0	0.50	ug/l	
74-84-0	Ethane	ND	1.0	0.50	ug/l	
74-98-6	Propane	ND	1.5	0.75	ug/l	
75-28-5	Isobutane	ND	1.5	0.75	ug/l	
106-97-8	Butane	ND	1.5	0.75	ug/l	



## Blank Spike Summary

Page 1 of 1

**Job Number:** TC20887

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS234-BS	SS005096.D	1	12/10/12	LT	n/a	n/a	GSS234

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20887-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	21.5	20.9	97	68-139
74-85-1	Ethene	57.4	43.4	76	52-145
74-84-0	Ethane	43.3	49.3	114	68-131
74-98-6	Propane	60.6	59.3	98	69-131
75-28-5	Isobutane	72.5	69.9	96	72-131
106-97-8	Butane	76.6	73.6	96	66-128

\* = Outside of Control Limits.

## Matrix Spike Summary

Page 1 of 1

**Job Number:** TC20887

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC21021-2MS	SS005113.D	1	12/10/12	LT	n/a	n/a	GSS234
TC21021-2	SS005112.D	1	12/10/12	LT	n/a	n/a	GSS234

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20887-1

CAS No.	Compound	TC21021-2 ug/l	Spike Q ug/l	MS ug/l	MS %	Limits
74-82-8	Methane	1.49	21.5	24.3	106	68-139
74-85-1	Ethene	ND	57.4	55.4	97	52-145
74-84-0	Ethane	ND	43.3	64.1	148*	68-131
74-98-6	Propane	ND	60.6	75.7	125	69-131
75-28-5	Isobutane	ND	72.5	87.2	120	72-131
106-97-8	Butane	ND	76.6	93.9	123	66-128

\* = Outside of Control Limits.

## Duplicate Summary

Page 1 of 1

**Job Number:** TC20887

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC21021-1DUP	SS005111.D	1	12/10/12	LT	n/a	n/a	GSS234
TC21021-1	SS005110.D	1	12/10/12	LT	n/a	n/a	GSS234

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20887-1

CAS No.	Compound	TC21021-1		Q	RPD	Limits
		ug/l	DUP ug/l			
74-82-8	Methane	0.88	0.86		2	53
74-85-1	Ethene	ND	ND		nc	27
74-84-0	Ethane	ND	ND		nc	43
74-98-6	Propane	ND	ND		nc	21
75-28-5	Isobutane	ND	ND		nc	35
106-97-8	Butane	ND	ND		nc	33

\* = Outside of Control Limits.

Lab #: 321087 Job #: 20030  
 Sample Name/Number: WW15-Hur-120212  
 Company: Oil Tracers, LLC  
 Date Sampled: 12/02/2012  
 Container: Dissolved Gas Bottle  
 Field/Site Name: Third Quarter Well Sampling  
 Location: Parker County, Texas  
 Formation/Depth:  
 Sampling Point:  
 Date Received: 12/05/2012 Date Reported: 2/01/2013

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{18}\text{O}$ ‰
Carbon Monoxide -----	nd			
Hydrogen Sulfide -----	na			
Helium -----	na			
Hydrogen -----	nd			
Argon -----	1.31			
Oxygen -----	0.096			
Nitrogen -----	72.45			
Carbon Dioxide -----	0.19			
Methane -----	25.04	-46.43	-157.5	
Ethane -----	0.910	-30.2		
Ethylene -----	nd			
Propane -----	nd			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	0.0011			
Iso-pentane -----	nd			
N-pentane -----	nd			
Hexanes + -----	0.0007			

**Remarks:**

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.73

\*Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

\*\* Ethane isotopes obtained online via GC-C-IRMS

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.



Reissue #1  
12/28/12

## Technical Report for

EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW25-Mat

Accutest Job Number: TC20881

Sampling Date: 12/02/12


Report to:

EarthCon Consultants  
4800 Sugar Grove Suite 420  
Stafford, TX 77477  
gfloreslovo@earthcon.com; djackson@jacksonsjoberg.com;  
mcpatton@rangeresources.com; escott@earthcon.com  
ATTN: Gabriela Floreslovo

Total number of pages in report: **27**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

  
Richard Rodriguez  
Laboratory Director

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366)  
LA (85695/04004) OK (211-035)

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories.  
Test results relate only to samples analyzed.



Gulf Coast. Inc.

10165 Harwin Drive  
Houston, TX 77036  
Tel: 713-271-4700

[www.accutest.com](http://www.accutest.com)

Friday, December 28, 2012

EarthCon Consultants  
4800 Sugar Grove, Suite 420  
Stafford, TX 77477  
ATTN: Gabriela Floreslovo

RE: Accutest job TC20881 Reissue

Dear Ms. Floreslovo:

The final report for job number TC20881 has been revised to add a "J" flag to the Ethane result.

I apologize for any inconvenience. Please feel free to contact me if I can be of further assistance.

Sincerely,

Elessa Sommers

Elessa Sommers  
Project Manager

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Sample Summary

EarthCon Consultants

Job No: TC20881

Quarterly Well Sampling, Parker County, Texas  
Project No: 3rd Quarter / WW25-Mat

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
TC20881-1	12/02/12	09:27	12/04/12	AQ	Ground Water	WW25-MAT-120212





## SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** EarthCon Consultants

**Job No** TC20881

**Site:** Quarterly Well Sampling, Parker County, Texas

**Report Date** 12/12/2012 9:39:20 AM

1 Sample was collected on 12/02/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20881. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### Volatiles by GCMS By Method SW846 8260B

**Matrix** AQ

**Batch ID:** VK578

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20506-1MS, TC20506-1MSD were used as the QC samples indicated.

### Volatiles by GC By Method RSKSOP-147/175

**Matrix** AQ

**Batch ID:** GSS233

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20879-1DUP, TC20970-2MS were used as the QC samples indicated.
- Matrix Spike Recovery for Methane is outside control limits. Outside control limits due to high level in sample relative to spike amount.
- TC20970-2MS: Sample was not preserved to a pH < 2.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used

Summary of Hits

**Job Number:** TC20881  
**Account:** EarthCon Consultants  
**Project:** Quarterly Well Sampling, Parker County, Texas  
**Collected:** 12/02/12



Lab Sample ID	Client Sample ID	Result/ Analyte	Qual	ML	SDL	Units	Method
TC20881-1	WW25-MAT-120212						
Methane		0.00676		0.00050	0.00030	mg/l	RSKSOP-147/175
Ethane		0.00081 J		0.0010	0.00050	mg/l	RSKSOP-147/175

Sample Results

Report of Analysis

## Report of Analysis

<b>Client Sample ID:</b>	WW25-MAT-120212	<b>Date Sampled:</b>	12/02/12
<b>Lab Sample ID:</b>	TC20881-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K13195.D	1	12/06/12	EM	n/a	n/a	VK578
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

## Purgeable Aromatics

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2	Benzene	0.00034 U	0.0010	0.00034	mg/l	
108-88-3	Toluene	0.00033 U	0.0010	0.00033	mg/l	
100-41-4	Ethylbenzene	0.00032 U	0.0010	0.00032	mg/l	
1330-20-7	Xylene (total)	0.00087 U	0.0030	0.00087	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	109%		72-122%
17060-07-0	1,2-Dichloroethane-D4	107%		68-124%
2037-26-5	Toluene-D8	105%		80-119%
460-00-4	4-Bromofluorobenzene	103%		72-126%

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	WW25-MAT-120212	<b>Date Sampled:</b>	12/02/12
<b>Lab Sample ID:</b>	TC20881-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	RSKSOP-147/175		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	SS005072.D	1	12/07/12	LT	n/a	n/a	GSS233
Run #2							

## RSK147 Special List

CAS No.	Compound	Result	MQL	SDL	Units	Q
74-82-8	Methane	0.00676	0.00050	0.00030	mg/l	
74-85-1	Ethene	0.00050 U	0.0010	0.00050	mg/l	
74-84-0	Ethane	0.00081	0.0010	0.00050	mg/l	J
74-98-6	Propane	0.00075 U	0.0015	0.00075	mg/l	
75-28-5	Isobutane	0.00075 U	0.0015	0.00075	mg/l	
106-97-8	Butane	0.00075 U	0.0015	0.00075	mg/l	

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Misc. Forms

5

### Custody Documents and Other Forms

---

Includes the following where applicable:

- Chain of Custody
- LRC Form



**Accutest Job Number:** TC20881      **Client:** EARTHCON CONSULTANTS      **Project:** 3RD QTR WELL SAMPLING,PARKER COUNTY,T  
**Date / Time Received:** 12/4/2012      **Delivery Method:** Client      **Airbill #'s:** \_\_\_\_\_  
**No. Coolers:** 1      **Therm ID:** IR6      **Temp Adjustment Factor:** 0.2  
**Cooler Temps (Initial/Adjusted):** #1: (2.2/2.4)

<b>Cooler Security</b>		<b>Y or N</b>		<b>Y or N</b>	
1. Custody Seals Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Cooler Temperature</b>		<b>Y or N</b>			
1. Temp criteria achieved:	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
2. Cooler temp verification:	Infrared Gun				
3. Cooler media:	Ice (bag)				
<b>Quality Control Preservation</b>	<b>Y</b>	<b>or</b>	<b>N</b>	<b>N/A</b>	<b>WTB STB</b>
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. Trip Blank listed on COC:	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Samples preserved properly:	<input checked="" type="checkbox"/>		<input type="checkbox"/>		
4. VOCs headspace free:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	

<b>Sample Integrity - Documentation</b>	<b>Y</b>	<b>or</b>	<b>N</b>
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
<b>Sample Integrity - Condition</b>	<b>Y</b>	<b>or</b>	<b>N</b>
1. Sample recvd within HT:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Condition of sample:	Intact		
<b>Sample Integrity - Instructions</b>	<b>Y</b>	<b>or</b>	<b>N</b>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Bottles received for unspecified tests	<input type="checkbox"/>		<input checked="" type="checkbox"/>
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
4. Compositing instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>		<input checked="" type="checkbox"/>

Comments -Received trip blank not listed on COC.



**Accutest Job Number:** TC20881

**CSR:** Elessa Sommers

**Response Date:** 12/5/2012

**Response:** Trip blank is on separate report.

5.1

5

**TC20881: Chain of Custody**  
**Page 3 of 4**

## Sample Receipt Log

Page 3 of 3

**Job #:** TC20881

**Date / Time Received:** 12/4/2012 9:22:00 AM

**Initials:** CH

**Client:** EARTHCON CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	pH	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20881-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20881-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20881-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20881-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20881-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20881-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4

 5.1  
5

**TC20881: Chain of Custody**
**Page 4 of 4**

# Appendix A Laboratory Data Package Cover Page

TC20881 This data package consists of

- ☐ This signature page, the laboratory review checklist, and the following reportable data:
- ☐ R1 Field chain-of-custody documentation;
- ☐ R2 Sample identification cross-reference;
- ☐ R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - a) Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
  - b) dilution factors,
  - c) preparation methods,
  - d) cleanup methods, and
  - e) if required for the project, tentatively identified compounds (TICs).
- ☐ R4 Surrogate recovery data including:
  - a) Calculated recovery (%R), and
  - b) The laboratory's surrogate QC limits.
- ☐ R5 Test reports/summary forms for blank samples;
- ☐ R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - a) LCS spiking amounts,
  - b) Calculated %R for each analyte, and
  - c) The laboratory's LCS QC limits.
- ☐ R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - a) Samples associated with the MS/MSD clearly identified,
  - b) MS/MSD spiking amounts,
  - c) Concentration of each MS/MSD analyte measured in the parent and
  - d) Calculated %Rs and relative percent differences (RPDs), and
  - e) The laboratory's MS/MSD QC limits
- ☐ R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - a) The amount of analyte measured in the duplicate,
  - b) The calculated RPD, and
  - c) The laboratory's QC limits for analytical duplicates.
- ☐ R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each
- ☐ R10 Other problems or anomalies.


The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

**Release Statement:** I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Report. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld.

**Check, if applicable:** This laboratory meets an exception under 30 TAC&25.6 and was last inspection by

☐ [X] TCEQ or ☐ \_\_\_\_\_ on April 2011. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

## QA Manager

Name (Printed)	Signature	Official Title (printed)	Date
Richard Rodriguez		Laboratory Director	12/12/2012
_____	_____	_____	_____

LABORATORY REVIEW CHECKLIST: REPORTABLE DATA									
Laboratory Name:		Accutest Gulf Coast		LRC Date:		12/12/2012			
Project Name:		Quarterly Well Sampling, Parker County, Texas		Laboratory Project Number:		TC20881			
Reviewer Name:		Anita Patel		Prep Batch Number(s):		GSS233, VK578			
# <sup>1</sup>	A <sup>2</sup>	DESCRIPTION				YES	NO	NA <sup>3</sup>	NR <sup>4</sup> ER # <sup>5</sup>
R1	OI	<b>CHAIN-OF-CUSTODY (C-O-C):</b>							
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?				X			
		Were all departures from standard conditions described in an exception report?				X			
R2	OI	<b>Sample and quality control (QC) identification</b>							
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?				X			
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?				X			
R3	OI	<b>Test reports</b>							
		Were samples prepared and analyzed within holding times?				X			
		Other than those results <MQL, were all other raw values bracketed by calibration standards?				X			
		Were calculations checked by a peer or supervisor?				X			
		Were all analyte identifications checked by a peer or supervisor?				X			
		Were sample detection limits reported for all analytes not detected?				X			
		Were all results for soil and sediment samples reported on a dry weight basis?						X	
		Were % moisture (or solids) reported for all soil and sediment samples?						X	
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?						X	
		If required for the project, are TIC's reported?						X	
R4	O	<b>Surrogate recovery data</b>							
		Were surrogates added prior to extraction?				X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?				X			
R5	OI	<b>Test reports/summary forms for blank samples</b>							
		Were appropriate type(s) of blanks analyzed?				X			
		Were blanks analyzed at the appropriate frequency?				X			
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?				X			
		Were blank concentrations <MQL?				X			
R6	OI	<b>Laboratory control samples (LCS):</b>							
		Were all COCs included in the LCS?				X			
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?				X			
		Were LCSs analyzed at required frequency?				X			
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?				X			
		Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?				X			5
		Was the LCSD RPD within QC limits?						X	
R7	OI	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>							
		Were the project/method specified analytes included in the MS and MSD?				X			
		Were MS/MSD analyzed at the appropriate frequency?				X			
		Were MS (and MSD, if applicable) %Rs within the laboratory QC Limits?					X		4
		Were the MS/MSD RPDs within laboratory QC limits?				X			
R8	OI	<b>Analytical duplicate data</b>							
		Were appropriate analytical duplicates analyzed for each matrix?				X			
		Were analytical duplicates analyzed at the appropriate frequency?				X			
		Were RPDs or relative standard deviations within the laboratory QC limits?				X			
R9	OI	<b>Method quantitation limits (MQLs):</b>							
		Are the MQLs for each method analyte included in the laboratory data package?				X			
		Do the MQLs correspond to the concentration of the lowest non-zero calibration				X			
		Are unadjusted MQLs and DCSSs included in the laboratory data package?					X		2
R10	OI	<b>Other problems/anomalies</b>							
		Are all known problems/anomalies/special conditions noted in this LRC and ER?				X			
		Was applicable and available technology used to lower the SDL to minimize the				X			
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package?				X			3

Laboratory Name:		Accutest Gulf Coast	LRC Date:		12/12/2012	
Project Name:		Quarterly Well Sampling, Parker	Laboratory Project Number:		TC20881	
Reviewer Name:		Anita Patel	Prep Batch Number(s):		GSS233, VK578	
# <sup>1</sup>	A <sup>2</sup>	DESCRIPTION	YES	NO	NA <sup>3</sup>	NR <sup>4</sup> ER # <sup>5</sup>
S1	OI	<b>Initial calibration (ICAL)</b>				
		Were response factors and/or relative response factors for each analyte within QC limits?	X			
		Were percent RSDs or correlation coefficient criteria met?	X			
		Was the number of standards recommended in the method used for all analytes?	X			
		Were all points generated between the lowest and highest standard used to calculate the curve?	X			
		Are ICAL data available for all instruments used?	X			
		Has the initial calibration curve been verified using an appropriate second source standard?	X			
S2	OI	<b>Initial and continuing calibration verification (ICCV AND CCV) and continuing</b>				
		Was the CCV analyzed at the method-required frequency?	X			
		Were percent differences for each analyte within the method-required QC limits?	X			
		Was the ICAL curve verified for each analyte?	X			
		Was the absolute value of the analyte concentration in the inorganic CCB-MDL?			X	
S3	O	<b>Mass spectral tuning</b>				
		Was the appropriate compound for the method used for tuning?	X			
		Were ion abundance data within the method-required QC limits?	X			
S4	O	<b>Internal standards (IS)</b>				
		Were IS area counts and retention times within the method-required QC limits?	X			
S5	OI	<b>Raw data (NELAC Section 5.5.10)</b>				
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X			
		Were data associated with manual integrations flagged on the raw data?	X			
S6	O	<b>Dual column confirmation</b>				
		Did dual column confirmation results meet the method-required QC?			X	
S7	O	<b>Tentatively identified compounds (TICs):</b>				
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X	
S8	I	<b>Interference Check Sample (ICS) results</b>				
		Were percent recoveries within method QC limits?			X	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>				
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X	
S10	OI	<b>Method detection limit (MDL) studies</b>				
		Was a MDL study performed for each reported analyte?	X			
		Is the MDL either adjusted or supported by the analysis of DCSSs?	X			5
S11	OI	<b>Proficiency test reports</b>				
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X			
S12	OI	<b>Standards documentation</b>				
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate source?	X			
S13	OI	<b>Compound/analyte identification procedures</b>				
		Are the procedures for compound/analyte identification documented?	X			
S14	OI	<b>Demonstration of analyst competency (DOC)</b>				
		Was DOC conducted consistent with NELAC Chapter 5?	X			
		Is documentation of the analyst's competency up-to-date and on file?	X			
S15	OI	<b>Verification/validation documentation for methods (NELAC Chapter 5)</b>				
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X			
S16	OI	<b>Laboratory standard operating procedures (SOPs)</b>				
		Are laboratory SOPs current and on file for each method performed?	X			

LABORATORY REVIEW CHECKLIST (continued): Exception Reports			
Laboratory Name:	Accutest Gulf Coast	LRC Date:	12/12/2012
Project Name:	Quarterly Well Sampling, Parker	Laboratory Project Number:	TC20881
Reviewer Name:	Anita Patel	Prep Batch Number(s):	GSS233, VK578
ER# <sup>1</sup>	Description		
1	For reporting purposes, the MQL is defined in the report as the RL. The unadjusted MQL/RL is reported in the method blank. The SDL is defined in the report as the MDL.		
2	For reporting purposes, the method blank represents the unadjusted MQL. The DCS is on file in the laboratory and is not included in the laboratory data package.		
3	The laboratory is NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package for analytes that are listed in the Texas Fields of Accreditation.		
4	All anomalies are discussed in the case narrative.		
5	The laboratory does not perform DCS analysis for Method RSKSOP-147/175. The components reported are not listed or do not have values in the Texas TRRP PCL tables.		

1ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on

## GC/MS Volatiles

## QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** TC20881

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VK578-MB	K13177.D	1	12/06/12	EM	n/a	n/a	VK578

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20881-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.34	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l	
108-88-3	Toluene	ND	1.0	0.33	ug/l	
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	107% 72-122%
17060-07-0	1,2-Dichloroethane-D4	105% 68-124%
2037-26-5	Toluene-D8	107% 80-119%
460-00-4	4-Bromofluorobenzene	103% 72-126%



## Blank Spike Summary

Page 1 of 1

**Job Number:** TC20881

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VK578-BS	K13175.D	1	12/06/12	EM	n/a	n/a	VK578

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20881-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	23.5	94	68-119
100-41-4	Ethylbenzene	25	23.4	94	71-117
108-88-3	Toluene	25	23.0	92	73-119
1330-20-7	Xylene (total)	75	71.7	96	74-119

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	103%	68-124%
2037-26-5	Toluene-D8	105%	80-119%
460-00-4	4-Bromofluorobenzene	101%	72-126%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** TC20881

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20506-1MS	K13179.D	1	12/06/12	EM	n/a	n/a	VK578
TC20506-1MSD	K13180.D	1	12/06/12	EM	n/a	n/a	VK578
TC20506-1	K13178.D	1	12/06/12	EM	n/a	n/a	VK578

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20881-1

CAS No.	Compound	TC20506-1 ug/l	Spike Q ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	25	23.4	94	23.1	92	1	68-119/12
100-41-4	Ethylbenzene	ND	25	22.9	92	22.6	90	1	71-117/12
108-88-3	Toluene	ND	25	23.0	92	22.1	88	4	73-119/13
1330-20-7	Xylene (total)	ND	75	71.6	95	69.3	92	3	74-119/13

CAS No.	Surrogate Recoveries	MS	MSD	TC20506-1	Limits
1868-53-7	Dibromofluoromethane	108%	108%	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	103%	105%	104%	68-124%
2037-26-5	Toluene-D8	107%	105%	106%	80-119%
460-00-4	4-Bromofluorobenzene	103%	104%	104%	72-126%

\* = Outside of Control Limits.

## GC Volatiles

## QC Data Summaries

---

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** TC20881

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS233-MB	SS005056.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20881-1

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	ND	0.50	0.30	ug/l	
74-85-1	Ethene	ND	1.0	0.50	ug/l	
74-84-0	Ethane	ND	1.0	0.50	ug/l	
74-98-6	Propane	ND	1.5	0.75	ug/l	
75-28-5	Isobutane	ND	1.5	0.75	ug/l	
106-97-8	Butane	ND	1.5	0.75	ug/l	

## Blank Spike Summary

Page 1 of 1

**Job Number:** TC20881

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS233-BS	SS005054.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20881-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	21.5	16.2	75	68-139
74-85-1	Ethene	57.4	43.2	75	52-145
74-84-0	Ethane	43.3	47.1	109	68-131
74-98-6	Propane	60.6	60.5	100	69-131
75-28-5	Isobutane	72.5	70.4	97	72-131
106-97-8	Butane	76.6	73.6	96	66-128

\* = Outside of Control Limits.

## Matrix Spike Summary

Page 1 of 1

**Job Number:** TC20881

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20970-2MS <sup>a</sup>	SS005067.D	1	12/07/12	LT	n/a	n/a	GSS233
TC20970-2 <sup>a</sup>	SS005066.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20881-1

CAS No.	Compound	TC20970-2 ug/l	Spike Q ug/l	MS ug/l	MS %	Limits
74-82-8	Methane	105	21.5	95.8	-42* <sup>b</sup>	68-139
74-85-1	Ethene	ND	57.4	46.6	81	52-145
74-84-0	Ethane	4.71	43.3	46.7	97	68-131
74-98-6	Propane	ND	60.6	53.4	88	69-131
75-28-5	Isobutane	ND	72.5	61.8	85	72-131
106-97-8	Butane	ND	76.6	66.0	86	66-128

(a) Sample was not preserved to a pH < 2.

(b) Outside control limits due to high level in sample relative to spike amount.

\* = Outside of Control Limits.

## Duplicate Summary

Page 1 of 1

**Job Number:** TC20881

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20879-1DUP	SS005062.D	1	12/07/12	LT	n/a	n/a	GSS233
TC20879-1	SS005061.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20881-1

CAS No.	Compound	TC20879-1	DUP	Q	RPD	Limits
		ug/l	Q ug/l			
74-82-8	Methane	4.10	3.34		20	53
74-85-1	Ethene	1.0 U	ND		nc	27
74-84-0	Ethane	1.0 U	ND		nc	43
74-98-6	Propane	1.5 U	ND		nc	21
75-28-5	Isobutane	1.5 U	ND		nc	35
106-97-8	Butane	1.5 U	ND		nc	33

\* = Outside of Control Limits.

Lab #: 321088 Job #: 20030  
 Sample Name/Number: WW25-Mat-120212  
 Company: Oil Tracers, LLC  
 Date Sampled: 12/02/2012  
 Container: Dissolved Gas Bottle  
 Field/Site Name: Third Quarter Well Sampling  
 Location: Parker County, Texas  
 Formation/Depth:  
 Sampling Point:  
 Date Received: 12/05/2012 Date Reported: 2/01/2013

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{18}\text{O}$ ‰
Carbon Monoxide -----	0.065			
Hydrogen Sulfide -----	na			
Helium -----	na			
Hydrogen -----	nd			
Argon -----	1.64			
Oxygen -----	15.11			
Nitrogen -----	82.80			
Carbon Dioxide -----	0.31			
Methane -----	0.0674			
Ethane -----	0.0023			
Ethylene -----	nd			
Propane -----	0.0009			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	nd			
Iso-pentane -----	nd			
N-pentane -----	nd			
Hexanes + -----	0.0005			

**Remarks:**

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.78

\*Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.





12/12/12

## Technical Report for

EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW7-Mer

Accutest Job Number: TC20871

Sampling Date: 11/30/12


Report to:

EarthCon Consultants  
4800 Sugar Grove Suite 420  
Stafford, TX 77477  
gfloreslovo@earthcon.com; djackson@jacksonsjoberg.com;  
mcpatton@rangeresources.com; escott@earthcon.com  
ATTN: Gabriela Floreslovo

Total number of pages in report: **26**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

  
Richard Rodriguez  
Laboratory Director

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366)  
LA (85695/04004) OK (211-035)

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Test results relate only to samples analyzed.

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Sample Summary

EarthCon Consultants

Job No: TC20871

Quarterly Well Sampling, Parker County, Texas  
Project No: 3rd Quarter / WW7-Mer

Sample Number	Collected		Matrix			Client Sample ID
	Date	Time By	Received	Code	Type	
TC20871-1	11/30/12	10:30	12/04/12	AQ	Ground Water	WW7-MER-113012



## SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** EarthCon Consultants

**Job No** TC20871

**Site:** Quarterly Well Sampling, Parker County, Texas

**Report Date** 12/12/2012 12:05:56 P

1 Sample was collected on 11/30/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20871. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### Volatiles by GCMS By Method SW846 8260B

**Matrix** AQ

**Batch ID:** VX1673

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20864-1MS, TC20864-1MSD were used as the QC samples indicated.

### Volatiles by GC By Method RSKSOP-147/175

**Matrix** AQ

**Batch ID:** GSS232

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20890-1DUP, TC20890-1MS were used as the QC samples indicated.
- Matrix Spike Recovery(s) for Ethene, Propane are outside control limits. Probable cause due to matrix interference.
- Matrix Spike Recovery(s) for Ethane, Methane are outside control limits. Outside control limits due to high level in sample relative to spike amount.
- RPD(s) for Duplicate for Butane, Isobutane, Propane are outside control limits for sample TC20890-1DUP.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used

Summary of Hits

**Job Number:** TC20871  
**Account:** EarthCon Consultants  
**Project:** Quarterly Well Sampling, Parker County, Texas  
**Collected:** 11/30/12



Lab Sample ID	Client Sample ID	Result/ Qual	MQL	SDL	Units	Method
TC20871-1	WW7-MER-113012					
Methane		1.63	0.0050	0.0030	mg/l	RSKSOP-147/175
Ethane		0.0629	0.0010	0.00050	mg/l	RSKSOP-147/175

Sample Results

Report of Analysis

## Report of Analysis

<b>Client Sample ID:</b>	WW7-MER-113012	<b>Date Sampled:</b>	11/30/12
<b>Lab Sample ID:</b>	TC20871-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	X0087068.D	1	12/06/12	CF	n/a	n/a	VX1673
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

## Purgeable Aromatics

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2	Benzene	0.00034 U	0.0010	0.00034	mg/l	
108-88-3	Toluene	0.00033 U	0.0010	0.00033	mg/l	
100-41-4	Ethylbenzene	0.00032 U	0.0010	0.00032	mg/l	
1330-20-7	Xylene (total)	0.00087 U	0.0030	0.00087	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		72-122%
17060-07-0	1,2-Dichloroethane-D4	97%		68-124%
2037-26-5	Toluene-D8	97%		80-119%
460-00-4	4-Bromofluorobenzene	97%		72-126%

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	WW7-MER-113012	<b>Date Sampled:</b>	11/30/12
<b>Lab Sample ID:</b>	TC20871-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	RSKSOP-147/175		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	SS005034.D	1	12/06/12	LT	n/a	n/a	GSS232
Run #2	SS005036.D	10	12/06/12	LT	n/a	n/a	GSS232

## RSK147 Special List

CAS No.	Compound	Result	MQL	SDL	Units	Q
74-82-8	Methane	1.63 <sup>a</sup>	0.0050	0.0030	mg/l	
74-85-1	Ethene	0.00050 U	0.0010	0.00050	mg/l	
74-84-0	Ethane	0.0629	0.0010	0.00050	mg/l	
74-98-6	Propane	0.00075 U	0.0015	0.00075	mg/l	
75-28-5	Isobutane	0.00075 U	0.0015	0.00075	mg/l	
106-97-8	Butane	0.00075 U	0.0015	0.00075	mg/l	

(a) Result is from Run# 2

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound



## Misc. Forms

5

### Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody
- LRC Form



## CHAIN OF CUSTODY

PAGE 1 OF 1

10165 Harwin Dr, Ste 150 Houston, TX 77036  
TEL 713-271-4700 FAX: 713-271-4770  
www.accutest.com

FED-EX Tracking #		Bottle Order Control #	
Accutest Quote #		Accutest Job # <b>TC20871</b>	
Client / Reporting Information		Project Information	
Company Name <b>EarthCon Consultants, Inc.</b>		Project Name <b>Third Quarterly Well Sampling, Parker County, Texas</b>	
Street Address <b>4800 Sugar Grove Blvd., Suite 390</b>		Street	
City State Zip <b>Stafford TX 77477</b>		Billing Information (If different from Report to) Company Name	
Project Contact <b>Gabriela Floreslovo</b>		Project #	
Phone # <b>281-201-3513</b>		Street Address	
Fax #		City State Zip	
Sampler(s) Name(s) <b>J Biuskowitz</b>		Client Purchase Order #	
Phone #		Attention:	
Collection		Number of preserved Bottles	
Accutest Sample #	Field ID / Point of Collection	Date	Time
1	WW-7-Mar-113012	11/24/12	1030
		Sampled By	Matrix
		JB	SW
		# of bottles	6
		HC	NaOH
		HN03	ZnAcOH
		HR04	HR04
		NOAE	NOAE
		DI Water	DI Water
		MEOH	MEOH
		TSP	TSP
		NaHSO4	NaHSO4
		ENCORE	ENCORE
		OTHER	OTHER
Turnaround Time (Business days)		Data Deliverable Information	
<input checked="" type="checkbox"/> Standard <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 4 Day RUSH <input type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day EMERGENCY Emergency & Rush T/A data available VIA Lablink		Approved By (Accutest PM): / Date:  <b>0922 @</b>	
		<input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> FULLT1 (Level 3+4) <input type="checkbox"/> REDT1 (Level 3+4) <input type="checkbox"/> Commercial "C"	
		<input checked="" type="checkbox"/> TRRP <input type="checkbox"/> EDD Format <input type="checkbox"/> Other	
		Commercial "A" = Results Only Commercial "B" = Results + QC Summary Commercial "C" = Results + QC & Surrogate Summary	
Relinquished By Sampler <b>J Biuskowitz</b>		Relinquished By: <b>2</b>	
Date Time: <b>12/24/12 1602</b>		Date Time:	
Relinquished by Sampler: <b>3</b>		Relinquished By: <b>4</b>	
Date Time:		Date Time:	
Relinquished by:		Custody Seal #	
Date Time:		<input type="checkbox"/> Intact <input type="checkbox"/> Not Intact	
Received By:		Preserved where applicable	
Date Time:		<input type="checkbox"/> On Ice <input type="checkbox"/> Cooler Temp.	

TC20871: Chain of Custody

Page 1 of 4

**Accutest Job Number:** TC20871      **Client:** EARTHCON CONSULTANTS      **Project:** 3RD QTR WELL SAMPLING,PARKER COUNTY,T  
**Date / Time Received:** 12/4/2012      **Delivery Method:** Client      **Airbill #'s:** \_\_\_\_\_  
**No. Coolers:** 1      **Therm ID:** IR6      **Temp Adjustment Factor:** 0.2  
**Cooler Temps (Initial/Adjusted):** #1: (2.2/2.4)

<b>Cooler Security</b>		<b>Y or N</b>		<b>Y or N</b>	
1. Custody Seals Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Cooler Temperature</b>		<b>Y or N</b>			
1. Temp criteria achieved:	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
2. Cooler temp verification:	Infrared Gun				
3. Cooler media:	Ice (bag)				
<b>Quality Control Preservation</b>	<b>Y</b>	<b>or</b>	<b>N</b>	<b>N/A</b>	<b>WTB STB</b>
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. Trip Blank listed on COC:	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Samples preserved properly:	<input checked="" type="checkbox"/>		<input type="checkbox"/>		
4. VOCs headspace free:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	

<b>Sample Integrity - Documentation</b>	<b>Y</b>	<b>or</b>	<b>N</b>
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
<b>Sample Integrity - Condition</b>	<b>Y</b>	<b>or</b>	<b>N</b>
1. Sample recvd within HT:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Condition of sample:	Intact		
<b>Sample Integrity - Instructions</b>	<b>Y</b>	<b>or</b>	<b>N</b>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Bottles received for unspecified tests	<input type="checkbox"/>		<input checked="" type="checkbox"/>
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>
4. Compositing instructions clear:	<input type="checkbox"/>		<input type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>		<input checked="" type="checkbox"/>

Comments - Received trip blank not listed on COC.

**TC20871: Chain of Custody**  
**Page 2 of 4**

**Accutest Job Number:** TC20871

**CSR:** Elessa Sommers

**Response Date:** 12/5/2012

**Response:** Trip blank is on separate report.

5.1

5

**TC20871: Chain of Custody**

**Page 3 of 4**

## Sample Receipt Log

**Job #:** TC20871

**Date / Time Received:** 12/4/2012 9:22:00 AM

**Initials:** CH

**Client:** EARTHCON CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	pH	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20871-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20871-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20871-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20871-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20871-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20871-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4

 5.1  
5

**TC20871: Chain of Custody**
**Page 4 of 4**

# Appendix A Laboratory Data Package Cover Page

TC20871 This data package consists of

- ☐ This signature page, the laboratory review checklist, and the following reportable data:
- ☐ R1 Field chain-of-custody documentation;
- ☐ R2 Sample identification cross-reference;
- ☐ R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - a) Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
  - b) dilution factors,
  - c) preparation methods,
  - d) cleanup methods, and
  - e) if required for the project, tentatively identified compounds (TICs).
- ☐ R4 Surrogate recovery data including:
  - a) Calculated recovery (%R), and
  - b) The laboratory's surrogate QC limits.
- ☐ R5 Test reports/summary forms for blank samples;
- ☐ R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - a) LCS spiking amounts,
  - b) Calculated %R for each analyte, and
  - c) The laboratory's LCS QC limits.
- ☐ R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - a) Samples associated with the MS/MSD clearly identified,
  - b) MS/MSD spiking amounts,
  - c) Concentration of each MS/MSD analyte measured in the parent and
  - d) Calculated %Rs and relative percent differences (RPDs), and
  - e) The laboratory's MS/MSD QC limits
- ☐ R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - a) The amount of analyte measured in the duplicate,
  - b) The calculated RPD, and
  - c) The laboratory's QC limits for analytical duplicates.
- ☐ R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each
- ☐ R10 Other problems or anomalies.


The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

**Release Statement:** I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Report. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld.

**Check, if applicable:** This laboratory meets an exception under 30 TAC&25.6 and was last inspection by

[ ] [X] TCEQ or [ ] \_\_\_\_\_ on April 2011. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

## QA Manager

Name (Printed)	Signature	Official Title (printed)	Date
Richard Rodriguez		Laboratory Director	12/12/2012
_____			_____

LABORATORY REVIEW CHECKLIST: REPORTABLE DATA									
Laboratory Name:		Accutest Gulf Coast		LRC Date:		12/12/2012			
Project Name:		Quarterly Well Sampling, Parker County, Texas		Laboratory Project Number:		TC20871			
Reviewer Name:		Anita Patel		Prep Batch Number(s):		GSS232, VX1673			
# <sup>1</sup>	A <sup>2</sup>	DESCRIPTION				YES	NO	NA <sup>3</sup>	NR <sup>4</sup> ER # <sup>5</sup>
R1	OI	<b>CHAIN-OF-CUSTODY (C-O-C):</b>							
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?				X			
		Were all departures from standard conditions described in an exception report?				X			
R2	OI	<b>Sample and quality control (QC) identification</b>							
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?				X			
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?				X			
R3	OI	<b>Test reports</b>							
		Were samples prepared and analyzed within holding times?				X			
		Other than those results <MQL, were all other raw values bracketed by calibration standards?				X			
		Were calculations checked by a peer or supervisor?				X			
		Were all analyte identifications checked by a peer or supervisor?				X			
		Were sample detection limits reported for all analytes not detected?				X			
		Were all results for soil and sediment samples reported on a dry weight basis?						X	
		Were % moisture (or solids) reported for all soil and sediment samples?						X	
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?						X	
		If required for the project, are TIC's reported?						X	
R4	O	<b>Surrogate recovery data</b>							
		Were surrogates added prior to extraction?				X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?				X			
R5	OI	<b>Test reports/summary forms for blank samples</b>							
		Were appropriate type(s) of blanks analyzed?				X			
		Were blanks analyzed at the appropriate frequency?				X			
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?				X			
		Were blank concentrations <MQL?				X			
R6	OI	<b>Laboratory control samples (LCS):</b>							
		Were all COCs included in the LCS?				X			
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?				X			
		Were LCSs analyzed at required frequency?				X			
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?				X			
		Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?				X			5
		Was the LCSD RPD within QC limits?						X	
R7	OI	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>							
		Were the project/method specified analytes included in the MS and MSD?				X			
		Were MS/MSD analyzed at the appropriate frequency?				X			
		Were MS (and MSD, if applicable) %Rs within the laboratory QC Limits?					X		4
		Were the MS/MSD RPDs within laboratory QC limits?				X			
R8	OI	<b>Analytical duplicate data</b>							
		Were appropriate analytical duplicates analyzed for each matrix?				X			
		Were analytical duplicates analyzed at the appropriate frequency?				X			
		Were RPDs or relative standard deviations within the laboratory QC limits?					X		4
R9	OI	<b>Method quantitation limits (MQLs):</b>							
		Are the MQLs for each method analyte included in the laboratory data package?				X			
		Do the MQLs correspond to the concentration of the lowest non-zero calibration				X			
		Are unadjusted MQLs and DCs included in the laboratory data package?					X		2
R10	OI	<b>Other problems/anomalies</b>							
		Are all known problems/anomalies/special conditions noted in this LRC and ER?				X			
		Was applicable and available technology used to lower the SDL to minimize the				X			
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package?				X			3

Laboratory Name:		Accutest Gulf Coast	LRC Date:		12/12/2012	
Project Name:		Quarterly Well Sampling, Parker	Laboratory Project Number:		TC20871	
Reviewer # <sup>1</sup>	Name: A <sup>2</sup>	Anita Patel	Prep Batch Number(s):		GSS232, VX1673	
		DESCRIPTION	YES	NO	NA <sup>3</sup>	NR <sup>4</sup> ER # <sup>5</sup>
S1	OI	<b>Initial calibration (ICAL)</b>				
		Were response factors and/or relative response factors for each analyte within QC limits?	X			
		Were percent RSDs or correlation coefficient criteria met?	X			
		Was the number of standards recommended in the method used for all analytes?	X			
		Were all points generated between the lowest and highest standard used to calculate the curve?	X			
		Are ICAL data available for all instruments used?	X			
		Has the initial calibration curve been verified using an appropriate second source standard?	X			
S2	OI	<b>Initial and continuing calibration verification (ICCV AND CCV) and continuing</b>				
		Was the CCV analyzed at the method-required frequency?	X			
		Were percent differences for each analyte within the method-required QC limits?	X			
		Was the ICAL curve verified for each analyte?	X			
		Was the absolute value of the analyte concentration in the inorganic CCB<MDL?			X	
S3	O	<b>Mass spectral tuning</b>				
		Was the appropriate compound for the method used for tuning?	X			
		Were ion abundance data within the method-required QC limits?	X			
S4	O	<b>Internal standards (IS)</b>				
		Were IS area counts and retention times within the method-required QC limits?	X			
S5	OI	<b>Raw data (NELAC Section 5.5.10)</b>				
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X			
		Were data associated with manual integrations flagged on the raw data?	X			
S6	O	<b>Dual column confirmation</b>				
		Did dual column confirmation results meet the method-required QC?			X	
S7	O	<b>Tentatively identified compounds (TICs):</b>				
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X	
S8	I	<b>Interference Check Sample (ICS) results</b>				
		Were percent recoveries within method QC limits?			X	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>				
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X	
S10	OI	<b>Method detection limit (MDL) studies</b>				
		Was a MDL study performed for each reported analyte?	X			
		Is the MDL either adjusted or supported by the analysis of DCSs?	X			5
S11	OI	<b>Proficiency test reports</b>				
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X			
S12	OI	<b>Standards documentation</b>				
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate source?	X			
S13	OI	<b>Compound/analyte identification procedures</b>				
		Are the procedures for compound/analyte identification documented?	X			
S14	OI	<b>Demonstration of analyst competency (DOC)</b>				
		Was DOC conducted consistent with NELAC Chapter 5?	X			
		Is documentation of the analyst's competency up-to-date and on file?	X			
S15	OI	<b>Verification/validation documentation for methods (NELAC Chapter 5)</b>				
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X			
S16	OI	<b>Laboratory standard operating procedures (SOPs)</b>				
		Are laboratory SOPs current and on file for each method performed?	X			



LABORATORY REVIEW CHECKLIST (continued): Exception Reports			
Laboratory Name:	Accutest Gulf Coast	LRC Date:	12/12/2012
Project Name:	Quarterly Well Sampling, Parker	Laboratory Project Number:	TC20871
Reviewer Name:	Anita Patel	Prep Batch Number(s):	GSS232, VX1673
ER# <sup>1</sup>	Description		
1	For reporting purposes, the MQL is defined in the report as the RL. The unadjusted MQL/RL is reported in the method blank. The SDL is defined in the report as the MDL.		
2	For reporting purposes, the method blank represents the unadjusted MQL. The DCS is on file in the laboratory and is not included in the laboratory data package.		
3	The laboratory is NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package for analytes that are listed in the Texas Fields of Accreditation.		
4	All anomalies are discussed in the case narrative.		
5	The laboratory does not perform DCS analysis for Method RSKSOP-147/175. The components reported are not listed or do not have values in the Texas TRRP PCL tables.		

1ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on

## GC/MS Volatiles

## QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** TC20871

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VX1673-MB	X0087062.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20871-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.34	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l	
108-88-3	Toluene	ND	1.0	0.33	ug/l	
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	105% 72-122%
17060-07-0	1,2-Dichloroethane-D4	95% 68-124%
2037-26-5	Toluene-D8	99% 80-119%
460-00-4	4-Bromofluorobenzene	98% 72-126%

## Blank Spike Summary

Page 1 of 1

**Job Number:** TC20871

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VX1673-BS	X0087060.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20871-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	22.2	89	68-119
100-41-4	Ethylbenzene	25	22.1	88	71-117
108-88-3	Toluene	25	22.4	90	73-119
1330-20-7	Xylene (total)	75	67.7	90	74-119

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	101%	72-122%
17060-07-0	1,2-Dichloroethane-D4	99%	68-124%
2037-26-5	Toluene-D8	101%	80-119%
460-00-4	4-Bromofluorobenzene	92%	72-126%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** TC20871

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20864-1MS	X0087064.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1MSD	X0087065.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1	X0087063.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20871-1

CAS No.	Compound	TC20864-1 ug/l	Spike Q ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	1.0 U	25	23.0	92	22.4	90	3	68-119/12
100-41-4	Ethylbenzene	1.0 U	25	22.7	91	22.4	90	1	71-117/12
108-88-3	Toluene	1.0 U	25	22.9	92	22.5	90	2	73-119/13
1330-20-7	Xylene (total)	3.0 U	75	69.8	93	68.4	91	2	74-119/13

CAS No.	Surrogate Recoveries	MS	MSD	TC20864-1	Limits
1868-53-7	Dibromofluoromethane	103%	101%	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	98%	98%	96%	68-124%
2037-26-5	Toluene-D8	100%	100%	100%	80-119%
460-00-4	4-Bromofluorobenzene	91%	92%	98%	72-126%

\* = Outside of Control Limits.

## GC Volatiles

## QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** TC20871

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS232-MB	SS005026.D	1	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20871-1

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	ND	0.50	0.30	ug/l	
74-85-1	Ethene	ND	1.0	0.50	ug/l	
74-84-0	Ethane	ND	1.0	0.50	ug/l	
74-98-6	Propane	ND	1.5	0.75	ug/l	
75-28-5	Isobutane	ND	1.5	0.75	ug/l	
106-97-8	Butane	ND	1.5	0.75	ug/l	

Blank Spike Summary

Job Number: TC20871  
Account: PESTXST EarthCon Consultants  
Project: Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS232-BS	SS005023.D	1	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples: Method: RSKSOP-147/175

TC20871-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	21.5	21.0	98	68-139
74-85-1	Ethene	57.4	54.7	95	52-145
74-84-0	Ethane	43.3	56.7	131	68-131
74-98-6	Propane	60.6	68.2	113	69-131
75-28-5	Isobutane	72.5	77.3	107	72-131
106-97-8	Butane	76.6	82.4	108	66-128

\* = Outside of Control Limits.



## Matrix Spike Summary

Page 1 of 1

**Job Number:** TC20871

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20890-1MS	SS005029.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005027.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005030.D	250	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

Method: RKSOP-147/175

TC20871-1

CAS No.	Compound	TC20890-1 ug/l	Spike Q	MS ug/l	MS %	Limits
74-82-8	Methane	20100 <sup>b</sup>	21.5	17100	-13815*	68-139
74-85-1	Ethene	1.0 U	57.4	5540	9654*	52-145
74-84-0	Ethane	3500 <sup>b</sup>	43.3	4120	1431* <sup>a</sup>	68-131
74-98-6	Propane	66.8	60.6	172	174*	69-131
75-28-5	Isobutane	8.41	72.5	93.3	117	72-131
106-97-8	Butane	10.3	76.6	101	119	66-128

(a) Outside control limits due to high level in sample relative to spike amount.

(b) Result is from Run #2.

\* = Outside of Control Limits.

## Duplicate Summary

Page 1 of 1

**Job Number:** TC20871

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20890-1DUP	SS005028.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005027.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005030.D	250	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20871-1

CAS No.	Compound	TC20890-1	DUP	Q	RPD	Limits
		ug/l	Q ug/l			
74-82-8	Methane	20100 <sup>a</sup>	16400	E	21	53
74-85-1	Ethene	1.0 U	ND		nc	27
74-84-0	Ethane	3500 <sup>a</sup>	4020	E	14	43
74-98-6	Propane	66.8	99.1		39*	21
75-28-5	Isobutane	8.41	12.1		36*	35
106-97-8	Butane	10.3	15.1		38*	33

(a) Result is from Run #2.

\* = Outside of Control Limits.

Lab #: 321079 Job #: 20030  
 Sample Name/Number: WW7-Mer-113012  
 Company: Oil Tracers, LLC  
 Date Sampled: 11/30/2012  
 Container: Dissolved Gas Bottle  
 Field/Site Name: Third Quarter Well Sampling  
 Location: Parker County, Texas  
 Formation/Depth:  
 Sampling Point:  
 Date Received: 12/05/2012 Date Reported: 2/01/2013

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{18}\text{O}$ ‰
Carbon Monoxide -----	nd			
Hydrogen Sulfide -----	na			
Helium -----	na			
Hydrogen -----	nd			
Argon -----	1.51			
Oxygen -----	0.14			
Nitrogen -----	80.41			
Carbon Dioxide -----	0.25			
Methane -----	17.48	-43.15	-138.4	
Ethane -----	0.210	-14.3		
Ethylene -----	nd			
Propane -----	nd			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	0.0004			
Iso-pentane -----	0.0008			
N-pentane -----	nd			
Hexanes + -----	nd			

**Remarks:**

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.76

\*Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

\*\* Ethane isotopes obtained online via GC-C-IRMS

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.



12/12/12

## Technical Report for

EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW2-Pur

Accutest Job Number: TC20890

Sampling Date: 11/30/12


Report to:

EarthCon Consultants  
4800 Sugar Grove Suite 420  
Stafford, TX 77477  
gfloreslovo@earthcon.com; djackson@jacksonsjoberg.com;  
mcpatton@rangeresources.com; escott@earthcon.com  
ATTN: Gabriela Floreslovo

Total number of pages in report: **26**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

  
Richard Rodriguez  
Laboratory Director

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366)  
LA (85695/04004) OK (211-035)

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Test results relate only to samples analyzed.

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Sample Summary

EarthCon Consultants

Job No: TC20890

Quarterly Well Sampling, Parker County, Texas  
Project No: 3rd Quarter / WW2-Pur

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
TC20890-1	11/30/12	15:25	12/04/12	AQ	Ground Water	WW2-PUR-113012
TC20890-1D	11/30/12	15:25	12/04/12	AQ	Water Dup/MSD	WW2-PUR-113012 MSD
TC20890-1S	11/30/12	15:25	12/04/12	AQ	Water Matrix Spike	WW2-PUR-113012 MS

## SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** EarthCon Consultants

**Job No** TC20890

**Site:** Quarterly Well Sampling, Parker County, Texas

**Report Date** 12/12/2012 12:12:02 P

1 Sample was collected on 11/30/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20890. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### Volatiles by GCMS By Method SW846 8260B

**Matrix** AQ

**Batch ID:** VK579

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20890-1MS, TC20890-1MSD were used as the QC samples indicated.

### Volatiles by GC By Method RSKSOP-147/175

**Matrix** AQ

**Batch ID:** GSS232

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20890-1DUP, TC20890-1MS were used as the QC samples indicated.
- Matrix Spike Recovery(s) for Ethene, Propane are outside control limits. Probable cause due to matrix interference.
- Matrix Spike Recovery(s) for Ethane, Methane are outside control limits. Outside control limits due to high level in sample relative to spike amount.
- RPD(s) for Duplicate for Butane, Isobutane, Propane are outside control limits for sample TC20890-1DUP.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used

## Summary of Hits

Page 1 of 1

**Job Number:** TC20890  
**Account:** EarthCon Consultants  
**Project:** Quarterly Well Sampling, Parker County, Texas  
**Collected:** 11/30/12



Lab Sample ID	Client Sample ID	Result/ Qual	MQL	SDL	Units	Method
TC20890-1	WW2-PUR-113012					
Benzene		0.00070 J	0.0010	0.00034	mg/l	SW846 8260B
Methane		20.1	0.13	0.075	mg/l	RSKSOP-147/175
Ethane		3.5	0.25	0.13	mg/l	RSKSOP-147/175
Propane		0.0668	0.0015	0.00075	mg/l	RSKSOP-147/175
Isobutane		0.00841	0.0015	0.00075	mg/l	RSKSOP-147/175
Butane		0.0103	0.0015	0.00075	mg/l	RSKSOP-147/175



Sample Results

Report of Analysis

## Report of Analysis

<b>Client Sample ID:</b>	WW2-PUR-113012	<b>Date Sampled:</b>	11/30/12
<b>Lab Sample ID:</b>	TC20890-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K13205.D	1	12/07/12	EM	n/a	n/a	VK579
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

## Purgeable Aromatics

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2	Benzene	0.00070	0.0010	0.00034	mg/l	J
108-88-3	Toluene	0.00033 U	0.0010	0.00033	mg/l	
100-41-4	Ethylbenzene	0.00032 U	0.0010	0.00032	mg/l	
1330-20-7	Xylene (total)	0.00087 U	0.0030	0.00087	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	109%		72-122%
17060-07-0	1,2-Dichloroethane-D4	111%		68-124%
2037-26-5	Toluene-D8	105%		80-119%
460-00-4	4-Bromofluorobenzene	102%		72-126%

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	WW2-PUR-113012	<b>Date Sampled:</b>	11/30/12
<b>Lab Sample ID:</b>	TC20890-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	RSKSOP-147/175		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	SS005027.D	1	12/06/12	LT	n/a	n/a	GSS232
Run #2	SS005030.D	250	12/06/12	LT	n/a	n/a	GSS232

## RSK147 Special List

CAS No.	Compound	Result	MQL	SDL	Units	Q
74-82-8	Methane	20.1 <sup>a</sup>	0.13	0.075	mg/l	
74-85-1	Ethene	0.00050 U	0.0010	0.00050	mg/l	
74-84-0	Ethane	3.5 <sup>a</sup>	0.25	0.13	mg/l	
74-98-6	Propane	0.0668	0.0015	0.00075	mg/l	
75-28-5	Isobutane	0.00841	0.0015	0.00075	mg/l	
106-97-8	Butane	0.0103	0.0015	0.00075	mg/l	

(a) Result is from Run# 2

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Misc. Forms

5

### Custody Documents and Other Forms

---

Includes the following where applicable:

- Chain of Custody
- LRC Form

10165 Harwin Dr, Ste 150 Houston, TX 77036  
TEL: 713-271-4700 FAX: 713-271-4770  
[www.accutest.com](http://www.accutest.com)

<b>ACCUTEST</b> Laboratories		10165 Harwin Dr, Ste 150 Houston, TX 77036 TEL: 713-271-4700 FAX: 713-271-4770 www.accutest.com		FED-EX Tracking # _____ Bottle Order Control # _____					
		Accutest Quote # _____ Accutest Job # <b>TC20890</b>							
<b>Client / Reporting Information</b>		<b>Project Information</b>		<b>Requested Analyses</b>				<b>Matrix Codes</b>	
Company Name <b>EarthCon Consultants, Inc.</b> Street Address <b>4800 Sugar Grove Blvd., Suite 390</b> City State Zip <b>Stafford TX 77477</b> Project Contact E-mail <b>Gabriela Floreslovo</b> Phone # Fax # <b>281-201-3513</b> Sampler(s) Name(s) Phone # <b>JA SH RM</b>		Project Name: <b>Third Quarterly Well Sampling, Parker County, Texas</b> Street Billing Information ( If different from Report to ) Company Name Street Address City State Zip Client Purchase Order # Project Manager Attention:		Requested Analyses BTEX 0260B Butane, Ethane, Ethene, Isobutane, Methane, Propane by RSK-175				Matrix Codes DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OL - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank	
Field ID / Point of Collection <b>1 WW2-P-1-113012</b> <b>(MS/MSD)</b>		Collection Date Time Sampled By Matrix # of bottles <b>11/30/12 1525 JB GW 18 K</b>							
Accutest Sample # <b>1</b>		Number of preserved Bottles HCl NaOH ZAN/NaOH HNO3 H2SO4 NONE DI Water MEQH NIN/BO4 TSP NIN/BO4 ENCORE OTHER <b>X X</b>		LAB USE ONLY					
Turnaround Time ( Business days )		Data Deliverable Information							
<input checked="" type="checkbox"/> Standard <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 4 Day RUSH <input type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day EMERGENCY Emergency & Rush TIA data available VIA Lablink		Approved By (Accutest PM): / Date: _____ _____ _____ _____ _____ _____		<input type="checkbox"/> Commercial "A" ( Level 1 ) <input type="checkbox"/> Commercial "B" ( Level 2 ) <input type="checkbox"/> FULLT1 ( Level 3+4 ) <input type="checkbox"/> REDT1 ( Level 3+4 ) <input type="checkbox"/> Commercial "C" Commercial "A" = Results Only Commercial "B" = Results + OC Summary Commercial "C" = Results + OC & Surrogate Summary		<input checked="" type="checkbox"/> TRRP <input type="checkbox"/> EDD Format <input type="checkbox"/> Other <b>Extra Volume For MS/MSD</b>			
Relinquished by Sampler: <b>JA SH RM</b> Relinquished by Sampler: <b>3</b> Relinquished by: <b>5</b>		Date Time: <b>12/4/12 1553</b> Date Time: Date Time: Date Time: Date Time:		Sample Custody must be documented below each time samples change possession, including courier delivery. Relinquished By: <b>2</b> Relinquished By: <b>4</b> Custody Seal # <input type="checkbox"/> Intact <input type="checkbox"/> Not Intact		Date Time: <b>2</b> Date Time: <b>4</b> Preserved where applicable <input type="checkbox"/> On Ice <input type="checkbox"/> Cooler Temp.			

## TC20890: Chain of Custody

Page 1 of 4

**Accutest Job Number:** TC20890      **Client:** EARTHCON CONSULTANTS      **Project:** 3RD QTR WELL SAMPLING,PARKER COUNTY,T  
**Date / Time Received:** 12/4/2012      **Delivery Method:** Client      **Airbill #'s:** \_\_\_\_\_  
**No. Coolers:** 1      **Therm ID:** IR6      **Temp Adjustment Factor:** 0.2  
**Cooler Temps (Initial/Adjusted):** #1: (2.2/2.4)

<b>Cooler Security</b>		<b>Y or N</b>		<b>Y or N</b>	
1. Custody Seals Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Cooler Temperature</b>		<b>Y or N</b>			
1. Temp criteria achieved:	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
2. Cooler temp verification:	Infrared Gun				
3. Cooler media:	Ice (bag)				
<b>Quality Control Preservation</b>	<b>Y</b>	<b>or N</b>	<b>N/A</b>	<b>WTB</b>	<b>STB</b>
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Trip Blank listed on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
3. Samples preserved properly:	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
4. VOCs headspace free:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

<b>Sample Integrity - Documentation</b>	<b>Y</b>	<b>or N</b>	
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Container labeling complete:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>Sample Integrity - Condition</b>	<b>Y</b>	<b>or N</b>	
1. Sample recvd within HT:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. All containers accounted for:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Condition of sample:	Intact		
<b>Sample Integrity - Instructions</b>	<b>Y</b>	<b>or N</b>	<b>N/A</b>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments -Received trip blank not listed on COC.

**Accutest Job Number:** TC20890

**CSR:** Elessa Sommers

**Response Date:** 12/5/2012

**Response:** Trip blank is on separate report.

5.1

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**TC20890: Chain of Custody**  
**Page 3 of 4**

## Sample Receipt Log

**Job #:** TC20890

**Date / Time Received:** 12/4/2012 9:22:00 AM

**Initials:** CH

**Client:** EARTHCON CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	pH	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20890-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	7	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	8	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	9	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	10	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	11	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	12	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	13	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	14	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	15	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	16	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	17	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20890-1	40ml	18	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4

**TC20890: Chain of Custody**
**Page 4 of 4**



# Appendix A Laboratory Data Package Cover Page

TC20890 This data package consists of

- ☐ This signature page, the laboratory review checklist, and the following reportable data:
- ☐ R1 Field chain-of-custody documentation;
- ☐ R2 Sample identification cross-reference;
- ☐ R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - a) Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
  - b) dilution factors,
  - c) preparation methods,
  - d) cleanup methods, and
  - e) if required for the project, tentatively identified compounds (TICs).
- ☐ R4 Surrogate recovery data including:
  - a) Calculated recovery (%R), and
  - b) The laboratory's surrogate QC limits.
- ☐ R5 Test reports/summary forms for blank samples;
- ☐ R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - a) LCS spiking amounts,
  - b) Calculated %R for each analyte, and
  - c) The laboratory's LCS QC limits.
- ☐ R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - a) Samples associated with the MS/MSD clearly identified,
  - b) MS/MSD spiking amounts,
  - c) Concentration of each MS/MSD analyte measured in the parent and
  - d) Calculated %Rs and relative percent differences (RPDs), and
  - e) The laboratory's MS/MSD QC limits
- ☐ R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - a) The amount of analyte measured in the duplicate,
  - b) The calculated RPD, and
  - c) The laboratory's QC limits for analytical duplicates.
- ☐ R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each
- ☐ R10 Other problems or anomalies.


The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

**Release Statement:** I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Report. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld.

**Check, if applicable:** This laboratory meets an exception under 30 TAC&25.6 and was last inspection by

☐ [X] TCEQ or ☐ \_\_\_\_\_ on April 2011. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

## QA Manager

Name (Printed)	Signature	Official Title (printed)	Date
Richard Rodriguez		Laboratory Director	12/12/2012
_____			_____

LABORATORY REVIEW CHECKLIST: REPORTABLE DATA									
Laboratory Name:		Accutest Gulf Coast		LRC Date:		12/12/2012			
Project Name:		Quarterly Well Sampling, Parker County, Texas		Laboratory Project Number:		TC20890			
Reviewer Name:		Anita Patel		Prep Batch Number(s):		GSS232, VK579			
# <sup>1</sup>	A <sup>2</sup>	DESCRIPTION				YES	NO	NA <sup>3</sup>	NR <sup>4</sup> ER # <sup>5</sup>
R1	OI	<b>CHAIN-OF-CUSTODY (C-O-C):</b>							
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?				X			
		Were all departures from standard conditions described in an exception report?				X			
R2	OI	<b>Sample and quality control (QC) identification</b>							
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?				X			
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?				X			
R3	OI	<b>Test reports</b>							
		Were samples prepared and analyzed within holding times?				X			
		Other than those results <MQL, were all other raw values bracketed by calibration standards?				X			
		Were calculations checked by a peer or supervisor?				X			
		Were all analyte identifications checked by a peer or supervisor?				X			
		Were sample detection limits reported for all analytes not detected?				X			
		Were all results for soil and sediment samples reported on a dry weight basis?						X	
		Were % moisture (or solids) reported for all soil and sediment samples?						X	
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?						X	
		If required for the project, are TIC's reported?						X	
R4	O	<b>Surrogate recovery data</b>							
		Were surrogates added prior to extraction?				X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?				X			
R5	OI	<b>Test reports/summary forms for blank samples</b>							
		Were appropriate type(s) of blanks analyzed?				X			
		Were blanks analyzed at the appropriate frequency?				X			
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?				X			
		Were blank concentrations <MQL?				X			
R6	OI	<b>Laboratory control samples (LCS):</b>							
		Were all COCs included in the LCS?				X			
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?				X			
		Were LCSs analyzed at required frequency?				X			
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?				X			
		Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?				X			5
		Was the LCSD RPD within QC limits?						X	
R7	OI	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>							
		Were the project/method specified analytes included in the MS and MSD?				X			
		Were MS/MSD analyzed at the appropriate frequency?				X			
		Were MS (and MSD, if applicable) %Rs within the laboratory QC Limits?					X		4
		Were the MS/MSD RPDs within laboratory QC limits?				X			
R8	OI	<b>Analytical duplicate data</b>							
		Were appropriate analytical duplicates analyzed for each matrix?				X			
		Were analytical duplicates analyzed at the appropriate frequency?				X			
		Were RPDs or relative standard deviations within the laboratory QC limits?					X		4
R9	OI	<b>Method quantitation limits (MQLs):</b>							
		Are the MQLs for each method analyte included in the laboratory data package?				X			
		Do the MQLs correspond to the concentration of the lowest non-zero calibration				X			
		Are unadjusted MQLs and DCSSs included in the laboratory data package?					X		2
R10	OI	<b>Other problems/anomalies</b>							
		Are all known problems/anomalies/special conditions noted in this LRC and ER?				X			
		Was applicable and available technology used to lower the SDL to minimize the				X			
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package?				X			3

Laboratory Name:		Accutest Gulf Coast	LRC Date:		12/12/2012	
Project Name:		Quarterly Well Sampling, Parker	Laboratory Project Number:		TC20890	
Reviewer Name:		Anita Patel	Prep Batch Number(s):		GSS232, VK579	
# <sup>1</sup>	A <sup>2</sup>	DESCRIPTION	YES	NO	NA <sup>3</sup>	NR <sup>4</sup> ER # <sup>5</sup>
S1	OI	<b>Initial calibration (ICAL)</b>				
		Were response factors and/or relative response factors for each analyte within QC limits?	X			
		Were percent RSDs or correlation coefficient criteria met?	X			
		Was the number of standards recommended in the method used for all analytes?	X			
		Were all points generated between the lowest and highest standard used to calculate the curve?	X			
		Are ICAL data available for all instruments used?	X			
		Has the initial calibration curve been verified using an appropriate second source standard?	X			
S2	OI	<b>Initial and continuing calibration verification (ICCV AND CCV) and continuing</b>				
		Was the CCV analyzed at the method-required frequency?	X			
		Were percent differences for each analyte within the method-required QC limits?	X			
		Was the ICAL curve verified for each analyte?	X			
		Was the absolute value of the analyte concentration in the inorganic CCB<MDL?			X	
S3	O	<b>Mass spectral tuning</b>				
		Was the appropriate compound for the method used for tuning?	X			
		Were ion abundance data within the method-required QC limits?	X			
S4	O	<b>Internal standards (IS)</b>				
		Were IS area counts and retention times within the method-required QC limits?	X			
S5	OI	<b>Raw data (NELAC Section 5.5.10)</b>				
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X			
		Were data associated with manual integrations flagged on the raw data?	X			
S6	O	<b>Dual column confirmation</b>				
		Did dual column confirmation results meet the method-required QC?			X	
S7	O	<b>Tentatively identified compounds (TICs):</b>				
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X	
S8	I	<b>Interference Check Sample (ICS) results</b>				
		Were percent recoveries within method QC limits?			X	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>				
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X	
S10	OI	<b>Method detection limit (MDL) studies</b>				
		Was a MDL study performed for each reported analyte?	X			
		Is the MDL either adjusted or supported by the analysis of DCSSs?	X			5
S11	OI	<b>Proficiency test reports</b>				
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X			
S12	OI	<b>Standards documentation</b>				
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate source?	X			
S13	OI	<b>Compound/analyte identification procedures</b>				
		Are the procedures for compound/analyte identification documented?	X			
S14	OI	<b>Demonstration of analyst competency (DOC)</b>				
		Was DOC conducted consistent with NELAC Chapter 5?	X			
		Is documentation of the analyst's competency up-to-date and on file?	X			
S15	OI	<b>Verification/validation documentation for methods (NELAC Chapter 5)</b>				
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X			
S16	OI	<b>Laboratory standard operating procedures (SOPs)</b>				
		Are laboratory SOPs current and on file for each method performed?	X			

LABORATORY REVIEW CHECKLIST (continued): Exception Reports			
Laboratory Name:	Accutest Gulf Coast	LRC Date:	12/12/2012
Project Name:	Quarterly Well Sampling, Parker	Laboratory Project Number:	TC20890
Reviewer Name:	Anita Patel	Prep Batch Number(s):	GSS232, VK579
ER#	Description		
1	For reporting purposes, the MQL is defined in the report as the RL. The unadjusted MQL/RL is reported in the method blank. The SDL is defined in the report as the MDL.		
2	For reporting purposes, the method blank represents the unadjusted MQL. The DCS is on file in the laboratory and is not included in the laboratory data package.		
3	The laboratory is NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package for analytes that are listed in the Texas Fields of Accreditation.		
4	All anomalies are discussed in the case narrative.		
5	The laboratory does not perform DCS analysis for Method RSKSOP-147/175. The components reported are not listed or do not have values in the Texas TRRP PCL tables.		

1ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on

## GC/MS Volatiles

### QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** TC20890

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VK579-MB	K13204.D	1	12/07/12	EM	n/a	n/a	VK579

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20890-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.34	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l	
108-88-3	Toluene	ND	1.0	0.33	ug/l	
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	110% 72-122%
17060-07-0	1,2-Dichloroethane-D4	107% 68-124%
2037-26-5	Toluene-D8	106% 80-119%
460-00-4	4-Bromofluorobenzene	100% 72-126%

## Blank Spike Summary

Page 1 of 1

**Job Number:** TC20890

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VK579-BS	K13202.D	1	12/07/12	EM	n/a	n/a	VK579

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20890-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	23.8	95	68-119
100-41-4	Ethylbenzene	25	24.0	96	71-117
108-88-3	Toluene	25	24.1	96	73-119
1330-20-7	Xylene (total)	75	74.5	99	74-119

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	107%	72-122%
17060-07-0	1,2-Dichloroethane-D4	105%	68-124%
2037-26-5	Toluene-D8	105%	80-119%
460-00-4	4-Bromofluorobenzene	100%	72-126%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** TC20890

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20890-1MS	K13206.D	1	12/07/12	EM	n/a	n/a	VK579
TC20890-1MSD	K13207.D	1	12/07/12	EM	n/a	n/a	VK579
TC20890-1	K13205.D	1	12/07/12	EM	n/a	n/a	VK579

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20890-1

CAS No.	Compound	TC20890-1 ug/l	Spike Q	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD	
71-43-2	Benzene	0.70	J	25	24.7	96	24.2	94	2	68-119/12
100-41-4	Ethylbenzene	1.0 U		25	23.0	92	22.7	91	1	71-117/12
108-88-3	Toluene	1.0 U		25	23.2	93	22.6	90	3	73-119/13
1330-20-7	Xylene (total)	3.0 U		75	71.5	95	71.1	95	1	74-119/13

CAS No.	Surrogate Recoveries	MS	MSD	TC20890-1	Limits
1868-53-7	Dibromofluoromethane	111%	110%	109%	72-122%
17060-07-0	1,2-Dichloroethane-D4	110%	110%	111%	68-124%
2037-26-5	Toluene-D8	105%	106%	105%	80-119%
460-00-4	4-Bromofluorobenzene	103%	102%	102%	72-126%

\* = Outside of Control Limits.



## GC Volatiles

## QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** TC20890

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS232-MB	SS005026.D	1	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20890-1

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	ND	0.50	0.30	ug/l	
74-85-1	Ethene	ND	1.0	0.50	ug/l	
74-84-0	Ethane	ND	1.0	0.50	ug/l	
74-98-6	Propane	ND	1.5	0.75	ug/l	
75-28-5	Isobutane	ND	1.5	0.75	ug/l	
106-97-8	Butane	ND	1.5	0.75	ug/l	

Blank Spike Summary

Job Number: TC20890  
Account: PESTXST EarthCon Consultants  
Project: Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS232-BS	SS005023.D	1	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples: Method: RSKSOP-147/175

TC20890-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	21.5	21.0	98	68-139
74-85-1	Ethene	57.4	54.7	95	52-145
74-84-0	Ethane	43.3	56.7	131	68-131
74-98-6	Propane	60.6	68.2	113	69-131
75-28-5	Isobutane	72.5	77.3	107	72-131
106-97-8	Butane	76.6	82.4	108	66-128

\* = Outside of Control Limits.

# Matrix Spike Summary

Page 1 of 1

**Job Number:** TC20890  
**Account:** PESTXST EarthCon Consultants  
**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20890-1MS	SS005029.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005027.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005030.D	250	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

Method: RKSOP-147/175

TC20890-1

CAS No.	Compound	TC20890-1 ug/l	Spike Q	MS ug/l	MS %	Limits
74-82-8	Methane	20100 <sup>b</sup>	21.5	17100	-13815*	68-139
74-85-1	Ethene	1.0 U	57.4	5540	9654*	52-145
74-84-0	Ethane	3500 <sup>b</sup>	43.3	4120	1431* <sup>a</sup>	68-131
74-98-6	Propane	66.8	60.6	172	174*	69-131
75-28-5	Isobutane	8.41	72.5	93.3	117	72-131
106-97-8	Butane	10.3	76.6	101	119	66-128

(a) Outside control limits due to high level in sample relative to spike amount.

(b) Result is from Run #2.

\* = Outside of Control Limits.

## Duplicate Summary

Page 1 of 1

**Job Number:** TC20890

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20890-1DUP	SS005028.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005027.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005030.D	250	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20890-1

CAS No.	Compound	TC20890-1	DUP	Q	RPD	Limits
		ug/l	Q ug/l			
74-82-8	Methane	20100 <sup>a</sup>	16400	E	21	53
74-85-1	Ethene	1.0 U	ND		nc	27
74-84-0	Ethane	3500 <sup>a</sup>	4020	E	14	43
74-98-6	Propane	66.8	99.1		39*	21
75-28-5	Isobutane	8.41	12.1		36*	35
106-97-8	Butane	10.3	15.1		38*	33

(a) Result is from Run #2.

\* = Outside of Control Limits.

Lab #: 321077 Job #: 20030  
 Sample Name/Number: WW2-Pur-113012  
 Company: Oil Tracers, LLC  
 Date Sampled: 11/30/2012  
 Container: Dissolved Gas Bottle  
 Field/Site Name: Third Quarter Well Sampling  
 Location: Parker County, Texas  
 Formation/Depth:  
 Sampling Point:  
 Date Received: 12/05/2012 Date Reported: 2/01/2013

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{18}\text{O}$ ‰
Carbon Monoxide -----	nd			
Hydrogen Sulfide -----	na			
Helium -----	na			
Hydrogen -----	nd			
Argon -----	0.217			
Oxygen -----	0.022			
Nitrogen -----	10.71			
Carbon Dioxide -----	0.082			
Methane -----	83.08	-50.48	-196.8	
Ethane -----	5.72	-32.80		
Ethylene -----	nd			
Propane -----	0.124	-28.1		
Propylene -----	nd			
Iso-butane -----	0.0153			
N-butane -----	0.0169			
Iso-pentane -----	0.0041			
N-pentane -----	0.0026			
Hexanes + -----	0.0052			

**Remarks:**

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.34

\*Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

\*\* Propane isotopes obtained online via GC-C-IRMS

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.



12/12/12

## Technical Report for

EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW-22-Sim

Accutest Job Number: TC20876

Sampling Date: 12/01/12


Report to:

EarthCon Consultants  
4800 Sugar Grove Suite 420  
Stafford, TX 77477  
gfloreslovo@earthcon.com; djackson@jacksonsjoberg.com;  
mcpatton@rangeresources.com; escott@earthcon.com  
ATTN: Gabriela Floreslovo

Total number of pages in report: **26**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

  
Richard Rodriguez  
Laboratory Director

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366)  
LA (85695/04004) OK (211-035)

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Test results relate only to samples analyzed.

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Sample Summary

EarthCon Consultants

Job No: TC20876

Quarterly Well Sampling, Parker County, Texas  
Project No: 3rd Quarter / WW-22-Sim

Sample Number	Collected		Matrix			Client Sample ID
	Date	Time By	Received	Code	Type	
TC20876-1	12/01/12	13:00	12/04/12	AQ	Ground Water	WW-22-SIM-120112



## SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** EarthCon Consultants

**Job No** TC20876

**Site:** Quarterly Well Sampling, Parker County, Texas

**Report Date** 12/12/2012 12:13:28 P

1 Sample was collected on 12/01/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20876. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### Volatiles by GCMS By Method SW846 8260B

**Matrix** AQ

**Batch ID:** VX1673

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20864-1MS, TC20864-1MSD were used as the QC samples indicated.

### Volatiles by GC By Method RSKSOP-147/175

**Matrix** AQ

**Batch ID:** GSS232

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20890-1DUP, TC20890-1MS were used as the QC samples indicated.
- Matrix Spike Recovery(s) for Ethene, Propane are outside control limits. Probable cause due to matrix interference.
- Matrix Spike Recovery(s) for Ethane, Methane are outside control limits. Outside control limits due to high level in sample relative to spike amount.
- RPD(s) for Duplicate for Butane, Isobutane, Propane are outside control limits for sample TC20890-1DUP.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used

Summary of Hits

**Job Number:** TC20876  
**Account:** EarthCon Consultants  
**Project:** Quarterly Well Sampling, Parker County, Texas  
**Collected:** 12/01/12



Lab Sample ID	Client Sample ID	Result/ Qual	MQL	SDL	Units	Method
TC20876-1	WW-22-SIM-120112					
Methane		4.19	0.025	0.015	mg/l	RSKSOP-147/175
Ethane		0.192	0.0010	0.00050	mg/l	RSKSOP-147/175

Sample Results

Report of Analysis

## Report of Analysis

<b>Client Sample ID:</b>	WW-22-SIM-120112	<b>Date Sampled:</b>	12/01/12
<b>Lab Sample ID:</b>	TC20876-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	X0087073.D	1	12/06/12	CF	n/a	n/a	VX1673
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

## Purgeable Aromatics

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2	Benzene	0.00034 U	0.0010	0.00034	mg/l	
108-88-3	Toluene	0.00033 U	0.0010	0.00033	mg/l	
100-41-4	Ethylbenzene	0.00032 U	0.0010	0.00032	mg/l	
1330-20-7	Xylene (total)	0.00087 U	0.0030	0.00087	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	104%		72-122%
17060-07-0	1,2-Dichloroethane-D4	96%		68-124%
2037-26-5	Toluene-D8	99%		80-119%
460-00-4	4-Bromofluorobenzene	97%		72-126%

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	WW-22-SIM-120112	<b>Date Sampled:</b>	12/01/12
<b>Lab Sample ID:</b>	TC20876-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	RSKSOP-147/175		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	SS005046.D	1	12/06/12	LT	n/a	n/a	GSS232
Run #2	SS005049.D	50	12/06/12	LT	n/a	n/a	GSS232

## RSK147 Special List

CAS No.	Compound	Result	MQL	SDL	Units	Q
74-82-8	Methane	4.19 <sup>a</sup>	0.025	0.015	mg/l	
74-85-1	Ethene	0.00050 U	0.0010	0.00050	mg/l	
74-84-0	Ethane	0.192	0.0010	0.00050	mg/l	
74-98-6	Propane	0.00075 U	0.0015	0.00075	mg/l	
75-28-5	Isobutane	0.00075 U	0.0015	0.00075	mg/l	
106-97-8	Butane	0.00075 U	0.0015	0.00075	mg/l	

(a) Result is from Run# 2

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Misc. Forms

5

### Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody
- LRC Form

10165 Harwin Dr, Ste 150 Houston, TX 77036  
TEL: 713-271-4700 FAX: 713-271-4770  
[www.accutest.com](http://www.accutest.com)

[illegible]

## TC20876: Chain of Custody

Page 1 of 4



**Accutest Job Number:** TC20876      **Client:** EARTHCON CONSULTANTS      **Project:** 3RD QTR WELL SAMPLING, PARKER COUNTY, T  
**Date / Time Received:** 12/4/2012      **Delivery Method:** Client      **Airbill #s:** \_\_\_\_\_  
**No. Coolers:** 1      **Therm ID:** IR6      **Temp Adjustment Factor:** 0.2  
**Cooler Temps (Initial/Adjusted):** #1: (2.2/2.4)

<b>Cooler Security</b>		<b>Y or N</b>		<b>Y or N</b>	
1. Custody Seals Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>

<b>Cooler Temperature</b>		<b>Y or N</b>
1. Temp criteria achieved:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Cooler temp verification:	Infrared Gun	
3. Cooler media:	Ice (bag)	

<b>Quality Control Preservation</b>	<b>Y or N</b>	<b>N/A</b>	<b>WTB</b>	<b>STB</b>
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Trip Blank listed on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
3. Samples preserved properly:	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
4. VOCs headspace free:	<input checked="" type="checkbox"/>	<input type="checkbox"/>		

<b>Sample Integrity - Documentation</b>	<b>Y or N</b>	
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>	<input type="checkbox"/>

<b>Sample Integrity - Condition</b>	<b>Y or N</b>
1. Sample recvd within HT:	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/> <input type="checkbox"/>
3. Condition of sample:	Intact

<b>Sample Integrity - Instructions</b>	<b>Y or N</b>	<b>N/A</b>	
1. Analysis requested is clear:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments - Received trip blank not listed on COC.

**Accutest Job Number:** TC20876

**CSR:** Elessa Sommers

**Response Date:** 12/5/2012

**Response:** Trip blank is on separate report.

5.1

5

**TC20876: Chain of Custody**

**Page 3 of 4**

## Sample Receipt Log

Page 3 of 3

**Job #:** TC20876

**Date / Time Received:** 12/4/2012 9:22:00 AM

**Initials:** CH

**Client:** EARTHCON CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	pH	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20876-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20876-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20876-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20876-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20876-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20876-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4

**TC20876: Chain of Custody**
**Page 4 of 4**

# Appendix A Laboratory Data Package Cover Page

TC20876 This data package consists of

- ☐ This signature page, the laboratory review checklist, and the following reportable data:
- ☐ R1 Field chain-of-custody documentation;
- ☐ R2 Sample identification cross-reference;
- ☐ R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - a) Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
  - b) dilution factors,
  - c) preparation methods,
  - d) cleanup methods, and
  - e) if required for the project, tentatively identified compounds (TICs).
- ☐ R4 Surrogate recovery data including:
  - a) Calculated recovery (%R), and
  - b) The laboratory's surrogate QC limits.
- ☐ R5 Test reports/summary forms for blank samples;
- ☐ R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - a) LCS spiking amounts,
  - b) Calculated %R for each analyte, and
  - c) The laboratory's LCS QC limits.
- ☐ R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - a) Samples associated with the MS/MSD clearly identified,
  - b) MS/MSD spiking amounts,
  - c) Concentration of each MS/MSD analyte measured in the parent and
  - d) Calculated %Rs and relative percent differences (RPDs), and
  - e) The laboratory's MS/MSD QC limits
- ☐ R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - a) The amount of analyte measured in the duplicate,
  - b) The calculated RPD, and
  - c) The laboratory's QC limits for analytical duplicates.
- ☐ R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each
- ☐ R10 Other problems or anomalies.


The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

**Release Statement:** I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Report. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld.

**Check, if applicable:** This laboratory meets an exception under 30 TAC&25.6 and was last inspection by

☐ [X] TCEQ or ☐ \_\_\_\_\_ on April 2011. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

## QA Manager

Name (Printed)	Signature	Official Title (printed)	Date
Richard Rodriguez		Laboratory Director	12/12/2012
_____			_____

LABORATORY REVIEW CHECKLIST: REPORTABLE DATA									
Laboratory Name:		Accutest Gulf Coast		LRC Date:		12/12/2012			
Project Name:		Quarterly Well Sampling, Parker County, Texas		Laboratory Project Number:		TC20876			
Reviewer Name:		Anita Patel		Prep Batch Number(s):		GSS232, VX1673			
# <sup>1</sup>	A <sup>2</sup>	DESCRIPTION				YES	NO	NA <sup>3</sup>	NR <sup>4</sup> ER # <sup>5</sup>
R1	OI	<b>CHAIN-OF-CUSTODY (C-O-C):</b>							
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?				X			
		Were all departures from standard conditions described in an exception report?				X			
R2	OI	<b>Sample and quality control (QC) identification</b>							
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?				X			
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?				X			
R3	OI	<b>Test reports</b>							
		Were samples prepared and analyzed within holding times?				X			
		Other than those results <MQL, were all other raw values bracketed by calibration standards?				X			
		Were calculations checked by a peer or supervisor?				X			
		Were all analyte identifications checked by a peer or supervisor?				X			
		Were sample detection limits reported for all analytes not detected?				X			
		Were all results for soil and sediment samples reported on a dry weight basis?						X	
		Were % moisture (or solids) reported for all soil and sediment samples?						X	
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?						X	
		If required for the project, are TIC's reported?						X	
R4	O	<b>Surrogate recovery data</b>							
		Were surrogates added prior to extraction?				X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?				X			
R5	OI	<b>Test reports/summary forms for blank samples</b>							
		Were appropriate type(s) of blanks analyzed?				X			
		Were blanks analyzed at the appropriate frequency?				X			
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?				X			
		Were blank concentrations <MQL?				X			
R6	OI	<b>Laboratory control samples (LCS):</b>							
		Were all COCs included in the LCS?				X			
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?				X			
		Were LCSs analyzed at required frequency?				X			
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?				X			
		Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?				X			5
		Was the LCSD RPD within QC limits?						X	
R7	OI	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>							
		Were the project/method specified analytes included in the MS and MSD?				X			
		Were MS/MSD analyzed at the appropriate frequency?				X			
		Were MS (and MSD, if applicable) %Rs within the laboratory QC Limits?					X		4
		Were the MS/MSD RPDs within laboratory QC limits?				X			
R8	OI	<b>Analytical duplicate data</b>							
		Were appropriate analytical duplicates analyzed for each matrix?				X			
		Were analytical duplicates analyzed at the appropriate frequency?				X			
		Were RPDs or relative standard deviations within the laboratory QC limits?					X		4
R9	OI	<b>Method quantitation limits (MQLs):</b>							
		Are the MQLs for each method analyte included in the laboratory data package?				X			
		Do the MQLs correspond to the concentration of the lowest non-zero calibration				X			
		Are unadjusted MQLs and DCs included in the laboratory data package?					X		2
R10	OI	<b>Other problems/anomalies</b>							
		Are all known problems/anomalies/special conditions noted in this LRC and ER?				X			
		Was applicable and available technology used to lower the SDL to minimize the				X			
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package?				X			3

Laboratory Name:		Accutest Gulf Coast	LRC Date:		12/12/2012	
Project Name:		Quarterly Well Sampling, Parker	Laboratory Project Number:		TC20876	
Reviewer Name:		Anita Patel	Prep Batch Number(s):		GSS232, VX1673	
# <sup>1</sup>	A <sup>2</sup>	DESCRIPTION	YES	NO	NA <sup>3</sup>	NR <sup>4</sup> ER # <sup>5</sup>
S1	OI	<b>Initial calibration (ICAL)</b>				
		Were response factors and/or relative response factors for each analyte within QC limits?	X			
		Were percent RSDs or correlation coefficient criteria met?	X			
		Was the number of standards recommended in the method used for all analytes?	X			
		Were all points generated between the lowest and highest standard used to calculate the curve?	X			
		Are ICAL data available for all instruments used?	X			
		Has the initial calibration curve been verified using an appropriate second source standard?	X			
S2	OI	<b>Initial and continuing calibration verification (ICCV AND CCV) and continuing</b>				
		Was the CCV analyzed at the method-required frequency?	X			
		Were percent differences for each analyte within the method-required QC limits?	X			
		Was the ICAL curve verified for each analyte?	X			
		Was the absolute value of the analyte concentration in the inorganic CCB<MDL?			X	
S3	O	<b>Mass spectral tuning</b>				
		Was the appropriate compound for the method used for tuning?	X			
		Were ion abundance data within the method-required QC limits?	X			
S4	O	<b>Internal standards (IS)</b>				
		Were IS area counts and retention times within the method-required QC limits?	X			
S5	OI	<b>Raw data (NELAC Section 5.5.10)</b>				
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X			
		Were data associated with manual integrations flagged on the raw data?	X			
S6	O	<b>Dual column confirmation</b>				
		Did dual column confirmation results meet the method-required QC?			X	
S7	O	<b>Tentatively identified compounds (TICs):</b>				
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X	
S8	I	<b>Interference Check Sample (ICS) results</b>				
		Were percent recoveries within method QC limits?			X	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>				
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X	
S10	OI	<b>Method detection limit (MDL) studies</b>				
		Was a MDL study performed for each reported analyte?	X			
		Is the MDL either adjusted or supported by the analysis of DCSs?	X			5
S11	OI	<b>Proficiency test reports</b>				
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X			
S12	OI	<b>Standards documentation</b>				
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate source?	X			
S13	OI	<b>Compound/analyte identification procedures</b>				
		Are the procedures for compound/analyte identification documented?	X			
S14	OI	<b>Demonstration of analyst competency (DOC)</b>				
		Was DOC conducted consistent with NELAC Chapter 5?	X			
		Is documentation of the analyst's competency up-to-date and on file?	X			
S15	OI	<b>Verification/validation documentation for methods (NELAC Chapter 5)</b>				
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X			
S16	OI	<b>Laboratory standard operating procedures (SOPs)</b>				
		Are laboratory SOPs current and on file for each method performed?	X			

LABORATORY REVIEW CHECKLIST (continued): Exception Reports			
Laboratory Name:		Accutest Gulf Coast	LRC Date:
Project Name:		Quarterly Well Sampling, Parker	12/12/2012
Reviewer Name:		Anita Patel	Laboratory Project Number:
			TC20876
		Prep Batch Number(s):	GSS232, VX1673
ER#	Description		
1	For reporting purposes, the MQL is defined in the report as the RL. The unadjusted MQL/RL is reported in the method blank. The SDL is defined in the report as the MDL.		
2	For reporting purposes, the method blank represents the unadjusted MQL. The DCS is on file in the laboratory and is not included in the laboratory data package.		
3	The laboratory is NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package for analytes that are listed in the Texas Fields of Accreditation.		
4	All anomalies are discussed in the case narrative.		
5	The laboratory does not perform DCS analysis for Method RSKSOP-147/175. The components reported are not listed or do not have values in the Texas TRRP PCL tables.		

1ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on

## GC/MS Volatiles

## QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



## Method Blank Summary

Page 1 of 1

**Job Number:** TC20876

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VX1673-MB	X0087062.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20876-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.34	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l	
108-88-3	Toluene	ND	1.0	0.33	ug/l	
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	105% 72-122%
17060-07-0	1,2-Dichloroethane-D4	95% 68-124%
2037-26-5	Toluene-D8	99% 80-119%
460-00-4	4-Bromofluorobenzene	98% 72-126%

## Blank Spike Summary

Page 1 of 1

**Job Number:** TC20876

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VX1673-BS	X0087060.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20876-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	22.2	89	68-119
100-41-4	Ethylbenzene	25	22.1	88	71-117
108-88-3	Toluene	25	22.4	90	73-119
1330-20-7	Xylene (total)	75	67.7	90	74-119

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	101%	72-122%
17060-07-0	1,2-Dichloroethane-D4	99%	68-124%
2037-26-5	Toluene-D8	101%	80-119%
460-00-4	4-Bromofluorobenzene	92%	72-126%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** TC20876

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20864-1MS	X0087064.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1MSD	X0087065.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1	X0087063.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20876-1

CAS No.	Compound	TC20864-1 ug/l	Spike Q ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	1.0 U	25	23.0	92	22.4	90	3	68-119/12
100-41-4	Ethylbenzene	1.0 U	25	22.7	91	22.4	90	1	71-117/12
108-88-3	Toluene	1.0 U	25	22.9	92	22.5	90	2	73-119/13
1330-20-7	Xylene (total)	3.0 U	75	69.8	93	68.4	91	2	74-119/13

CAS No.	Surrogate Recoveries	MS	MSD	TC20864-1	Limits
1868-53-7	Dibromofluoromethane	103%	101%	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	98%	98%	96%	68-124%
2037-26-5	Toluene-D8	100%	100%	100%	80-119%
460-00-4	4-Bromofluorobenzene	91%	92%	98%	72-126%

\* = Outside of Control Limits.

## GC Volatiles

## QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** TC20876

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS232-MB	SS005026.D	1	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20876-1

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	ND	0.50	0.30	ug/l	
74-85-1	Ethene	ND	1.0	0.50	ug/l	
74-84-0	Ethane	ND	1.0	0.50	ug/l	
74-98-6	Propane	ND	1.5	0.75	ug/l	
75-28-5	Isobutane	ND	1.5	0.75	ug/l	
106-97-8	Butane	ND	1.5	0.75	ug/l	

## Blank Spike Summary

Page 1 of 1

**Job Number:** TC20876

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS232-BS	SS005023.D	1	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20876-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	21.5	21.0	98	68-139
74-85-1	Ethene	57.4	54.7	95	52-145
74-84-0	Ethane	43.3	56.7	131	68-131
74-98-6	Propane	60.6	68.2	113	69-131
75-28-5	Isobutane	72.5	77.3	107	72-131
106-97-8	Butane	76.6	82.4	108	66-128

\* = Outside of Control Limits.

## Matrix Spike Summary

Page 1 of 1

**Job Number:** TC20876

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20890-1MS	SS005029.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005027.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005030.D	250	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

Method: RKSOP-147/175

TC20876-1

CAS No.	Compound	TC20890-1 ug/l	Spike Q	MS ug/l	MS %	Limits
74-82-8	Methane	20100 <sup>b</sup>	21.5	17100	-13815*	68-139
74-85-1	Ethene	1.0 U	57.4	5540	9654*	52-145
74-84-0	Ethane	3500 <sup>b</sup>	43.3	4120	1431* <sup>a</sup>	68-131
74-98-6	Propane	66.8	60.6	172	174*	69-131
75-28-5	Isobutane	8.41	72.5	93.3	117	72-131
106-97-8	Butane	10.3	76.6	101	119	66-128

(a) Outside control limits due to high level in sample relative to spike amount.

(b) Result is from Run #2.

\* = Outside of Control Limits.

## Duplicate Summary

Page 1 of 1

**Job Number:** TC20876

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20890-1DUP	SS005028.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005027.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005030.D	250	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20876-1

CAS No.	Compound	TC20890-1 ug/l	DUP Q ug/l	Q	RPD	Limits
74-82-8	Methane	20100 <sup>a</sup>	16400	E	21	53
74-85-1	Ethene	1.0 U	ND		nc	27
74-84-0	Ethane	3500 <sup>a</sup>	4020	E	14	43
74-98-6	Propane	66.8	99.1		39*	21
75-28-5	Isobutane	8.41	12.1		36*	35
106-97-8	Butane	10.3	15.1		38*	33

(a) Result is from Run #2.

\* = Outside of Control Limits.



Lab #: 321084 Job #: 20030  
 Sample Name/Number: WW22-Sim-120112  
 Company: Oil Tracers, LLC  
 Date Sampled: 12/01/2012  
 Container: Dissolved Gas Bottle  
 Field/Site Name: Third Quarter Well Sampling  
 Location: Parker County, Texas  
 Formation/Depth:  
 Sampling Point:  
 Date Received: 12/05/2012 Date Reported: 2/01/2013

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{18}\text{O}$ ‰
Carbon Monoxide -----	nd			
Hydrogen Sulfide -----	na			
Helium -----	na			
Hydrogen -----	nd			
Argon -----	1.42			
Oxygen -----	0.10			
Nitrogen -----	76.60			
Carbon Dioxide -----	0.20			
Methane -----	21.17	-44.40	-153.1	
Ethane -----	0.510	-23.1		
Ethylene -----	nd			
Propane -----	nd			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	0.0007			
Iso-pentane -----	0.0011			
N-pentane -----	nd			
Hexanes + -----	nd			

**Remarks:**

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.73

\*Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

\*\* Ethane isotopes obtained online via GC-C-IRMS

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.



12/12/12

## Technical Report for

EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW24-Smi

Accutest Job Number: TC20880

Sampling Date: 11/30/12


Report to:

EarthCon Consultants  
4800 Sugar Grove Suite 420  
Stafford, TX 77477  
gfloreslovo@earthcon.com; djackson@jacksonsjoberg.com;  
mcpatton@rangeresources.com; escott@earthcon.com  
ATTN: Gabriela Floreslovo

Total number of pages in report: **26**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

  
Richard Rodriguez  
Laboratory Director

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366)  
LA (85695/04004) OK (211-035)

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Test results relate only to samples analyzed.

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Sample Summary

EarthCon Consultants

Job No: TC20880

Quarterly Well Sampling, Parker County, Texas  
Project No: 3rd Quarter / WW24-Smi

Sample Number	Collected		Matrix			Client Sample ID
	Date	Time By	Received	Code	Type	
TC20880-1	11/30/12	13:10	12/04/12	AQ	Ground Water	WW24-SMI-113012



## SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** EarthCon Consultants

**Job No** TC20880

**Site:** Quarterly Well Sampling, Parker County, Texas

**Report Date** 12/12/2012 9:46:27 AM

1 Sample was collected on 11/30/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20880. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### Volatiles by GCMS By Method SW846 8260B

**Matrix** AQ

**Batch ID:** VX1673

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20864-1MS, TC20864-1MSD were used as the QC samples indicated.

### Volatiles by GC By Method RSKSOP-147/175

**Matrix** AQ

**Batch ID:** GSS233

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20879-1DUP, TC20970-2MS were used as the QC samples indicated.
- Matrix Spike Recovery for Methane is outside control limits. Outside control limits due to high level in sample relative to spike amount.
- TC20970-2MS: Sample was not preserved to a pH < 2.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used

Summary of Hits

**Job Number:** TC20880  
**Account:** EarthCon Consultants  
**Project:** Quarterly Well Sampling, Parker County, Texas  
**Collected:** 11/30/12



Lab Sample ID	Client Sample ID	Result/ Analyte	Qual	ML	SDL	Units	Method
TC20880-1	WW24-SMI-113012						
Methane		0.117		0.00050	0.00030	mg/l	RSKSOP-147/175
Ethane		0.0136		0.0010	0.00050	mg/l	RSKSOP-147/175

## Sample Results

## Report of Analysis

## Report of Analysis

<b>Client Sample ID:</b>	WW24-SMI-113012	<b>Date Sampled:</b>	11/30/12
<b>Lab Sample ID:</b>	TC20880-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	X0087077.D	1	12/06/12	CF	n/a	n/a	VX1673
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

## Purgeable Aromatics

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2	Benzene	0.00034 U	0.0010	0.00034	mg/l	
108-88-3	Toluene	0.00033 U	0.0010	0.00033	mg/l	
100-41-4	Ethylbenzene	0.00032 U	0.0010	0.00032	mg/l	
1330-20-7	Xylene (total)	0.00087 U	0.0030	0.00087	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%		72-122%
17060-07-0	1,2-Dichloroethane-D4	94%		68-124%
2037-26-5	Toluene-D8	98%		80-119%
460-00-4	4-Bromofluorobenzene	99%		72-126%

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound



## Report of Analysis

<b>Client Sample ID:</b>	WW24-SMI-113012	<b>Date Sampled:</b>	11/30/12
<b>Lab Sample ID:</b>	TC20880-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	RSKSOP-147/175		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	SS005071.D	1	12/07/12	LT	n/a	n/a	GSS233
Run #2							

## RSK147 Special List

CAS No.	Compound	Result	MQL	SDL	Units	Q
74-82-8	Methane	0.117	0.00050	0.00030	mg/l	
74-85-1	Ethene	0.00050 U	0.0010	0.00050	mg/l	
74-84-0	Ethane	0.0136	0.0010	0.00050	mg/l	
74-98-6	Propane	0.00075 U	0.0015	0.00075	mg/l	
75-28-5	Isobutane	0.00075 U	0.0015	0.00075	mg/l	
106-97-8	Butane	0.00075 U	0.0015	0.00075	mg/l	

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Misc. Forms

5

### Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody
- LRC Form



## CHAIN OF CUSTODY

PAGE 1 OF 1

10165 Harwin Dr, Ste 150 Houston, TX 77036  
TEL: 713-271-4700 FAX: 713-271-4770  
www.accutest.com

FED-EX Tracking #		Bottle Order Control #	
Accutest Quote #		Accutest Job # <b>TC20880</b>	
Client / Reporting Information		Project Information	
Company Name <b>EarthCon Consultants, Inc.</b>		Project Name <b>Third Quarterly Well Sampling, Parker County, Texas</b>	
Street Address <b>4800 Sugar Grove Blvd., Suite 390</b>		Billing Information (if different from Report to)	
City State Zip <b>Stafford TX 77477</b>		Company Name	
Project Contact <b>Gabriela Floreslovo</b>		Street Address	
Phone # Fax # <b>281-201-3513</b>		City State Zip	
Sampler(s) Name(s) <b>JB, SH, RM</b>		Project Manager Attention:	
Field ID / Point of Collection <b>1 WW24-Sm-113012</b>		Collection	
Date <b>11-30-12</b>		Time <b>15:00</b>	
Sampled By <b>JB</b>		Matrix <b>GW</b>	
# of bottles <b>6</b>		Number of preserved bottles	
UGI		NaOH	
Zn/NaOH		HNO3	
H2SO4		NONE	
DI Water		METH	
TSP		NaOH	
ENCORE		OTHER	
BTX 6200B		Butane, Ethane, Ethene, Isobutane, Methane, Propane by RSK-175	
Matrix Codes		LAB USE ONLY	
DW - Drinking Water			
GW - Ground Water			
WW - Water			
SW - Surface Water			
SO - Soil			
SL - Sludge			
SED - Sediment			
OI - Oil			
LIQ - Other Liquid			
AIR - Air			
SOL - Other Solid			
WP - Wipe			
FB - Field Blank			
Turnaround Time (Business days)		Data Deliverable Information	
<input checked="" type="checkbox"/> Standard		Approved By (Accutest PM): / Date:	
<input type="checkbox"/> 5 Day RUSH			
<input type="checkbox"/> 4 Day RUSH			
<input type="checkbox"/> 3 Day RUSH			
<input type="checkbox"/> 2 Day RUSH			
<input type="checkbox"/> 1 Day EMERGENCY			
Emergency & Rush TIA data available VIA Lablink		<input type="checkbox"/> Commercial "A" (Level 1)	
		<input type="checkbox"/> Commercial "B" (Level 2)	
		<input type="checkbox"/> FULT1 (Level 3+4)	
		<input type="checkbox"/> REDT1 (Level 3+4)	
		<input type="checkbox"/> Commercial "C"	
		<input checked="" type="checkbox"/> TRRP	
		<input type="checkbox"/> EDD Format	
		<input type="checkbox"/> Other	
		Commercial "A" = Results Only	
		Commercial "B" = Results + QC Summary	
		Commercial "C" = Results + QC & Surrogate Summary	
Relinquished by Sampler: <b>JB</b>		Date Time: <b>12-4-12 0922</b>	
Relinquished by Sampler: <b>3</b>		Date Time: <b>12/4/12 1617</b>	
Relinquished by Sampler: <b>5</b>		Date Time:	
Received By: <b>1</b>		Received By: <b>2</b>	
Received By: <b>3</b>		Received By: <b>4</b>	
Received By: <b>5</b>		Received By:	
Custody Seal #		Intact <input type="checkbox"/> Not Intact <input type="checkbox"/>	
Preserved where applicable <input type="checkbox"/>		On Ice <input type="checkbox"/> Cooler Temp.	

TC20880: Chain of Custody

Page 1 of 4

**Accutest Job Number:** TC20880      **Client:** EARTHCON CONSULTANTS      **Project:** 3RD QTR WELL SAMPLING, PARKER COUNTY, T  
**Date / Time Received:** 12/4/2012      **Delivery Method:** Client      **Airbill #s:** \_\_\_\_\_  
**No. Coolers:** 1      **Therm ID:** IR6      **Temp Adjustment Factor:** 0.2  
**Cooler Temps (Initial/Adjusted):** #1: (2.2/2.4)

<b>Cooler Security</b>		<b>Y or N</b>		<b>Y or N</b>	
1. Custody Seals Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Cooler Temperature</b>		<b>Y or N</b>			
1. Temp criteria achieved:	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
2. Cooler temp verification:	Infrared Gun				
3. Cooler media:	Ice (bag)				
<b>Quality Control Preservation</b>		<b>Y or N</b>	<b>N/A</b>	<b>WTB</b>	<b>STB</b>
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Trip Blank listed on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
3. Samples preserved properly:	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
4. VOCs headspace free:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		

<b>Sample Integrity - Documentation</b>		<b>Y or N</b>	
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Container labeling complete:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>Sample Integrity - Condition</b>		<b>Y or N</b>	
1. Sample recvd within HT:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. All containers accounted for:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Condition of sample:	Intact		
<b>Sample Integrity - Instructions</b>		<b>Y or N</b>	<b>N/A</b>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments -Received trip blank not listed on COC.  
 -Received one of six vials with headspace bigger than pea size.

**Accutest Job Number:** TC20880**CSR:** Elessa Sommers**Response Date:** 12/5/2012

**Response:** Trip blank is on separate report. Sufficient number of vials without headspace are available for the requested analyses.

5.1

5

**TC20880: Chain of Custody****Page 3 of 4**

# Sample Receipt Log

**Job #:** TC20880

**Date / Time Received:** 12/4/2012 9:22:00 AM

**Initials:** CH

**Client:** EARTHCON CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	pH	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20880-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20880-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20880-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20880-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20880-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20880-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4

5.1  
5

**TC20880: Chain of Custody**

**Page 4 of 4**

# Appendix A Laboratory Data Package Cover Page

TC20880 This data package consists of

- ☐ This signature page, the laboratory review checklist, and the following reportable data:
- ☐ R1 Field chain-of-custody documentation;
- ☐ R2 Sample identification cross-reference;
- ☐ R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - a) Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
  - b) dilution factors,
  - c) preparation methods,
  - d) cleanup methods, and
  - e) if required for the project, tentatively identified compounds (TICs).
- ☐ R4 Surrogate recovery data including:
  - a) Calculated recovery (%R), and
  - b) The laboratory's surrogate QC limits.
- ☐ R5 Test reports/summary forms for blank samples;
- ☐ R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - a) LCS spiking amounts,
  - b) Calculated %R for each analyte, and
  - c) The laboratory's LCS QC limits.
- ☐ R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - a) Samples associated with the MS/MSD clearly identified,
  - b) MS/MSD spiking amounts,
  - c) Concentration of each MS/MSD analyte measured in the parent and
  - d) Calculated %Rs and relative percent differences (RPDs), and
  - e) The laboratory's MS/MSD QC limits
- ☐ R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - a) The amount of analyte measured in the duplicate,
  - b) The calculated RPD, and
  - c) The laboratory's QC limits for analytical duplicates.
- ☐ R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each
- ☐ R10 Other problems or anomalies.


The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

**Release Statement:** I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Report. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld.

**Check, if applicable:** This laboratory meets an exception under 30 TAC&25.6 and was last inspection by

☐ [X] TCEQ or ☐ \_\_\_\_\_ on April 2011. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

## QA Manager

Name (Printed)	Signature	Official Title (printed)	Date
Richard Rodriguez		Laboratory Director	12/12/2012
_____	_____	_____	_____

LABORATORY REVIEW CHECKLIST: REPORTABLE DATA									
Laboratory Name:		Accutest Gulf Coast		LRC Date:		12/12/2012			
Project Name:		Quarterly Well Sampling, Parker County, Texas		Laboratory Project Number:		TC20880			
Reviewer Name:		Anita Patel		Prep Batch Number(s):		GSS233, VX1673			
# <sup>1</sup>	A <sup>2</sup>	DESCRIPTION				YES	NO	NA <sup>3</sup>	NR <sup>4</sup> ER # <sup>5</sup>
R1	OI	<b>CHAIN-OF-CUSTODY (C-O-C):</b>							
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?				X			
		Were all departures from standard conditions described in an exception report?				X			
R2	OI	<b>Sample and quality control (QC) identification</b>							
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?				X			
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?				X			
R3	OI	<b>Test reports</b>							
		Were samples prepared and analyzed within holding times?				X			
		Other than those results <MQL, were all other raw values bracketed by calibration standards?				X			
		Were calculations checked by a peer or supervisor?				X			
		Were all analyte identifications checked by a peer or supervisor?				X			
		Were sample detection limits reported for all analytes not detected?				X			
		Were all results for soil and sediment samples reported on a dry weight basis?						X	
		Were % moisture (or solids) reported for all soil and sediment samples?						X	
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?						X	
		If required for the project, are TIC's reported?						X	
R4	O	<b>Surrogate recovery data</b>							
		Were surrogates added prior to extraction?				X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?				X			
R5	OI	<b>Test reports/summary forms for blank samples</b>							
		Were appropriate type(s) of blanks analyzed?				X			
		Were blanks analyzed at the appropriate frequency?				X			
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?				X			
		Were blank concentrations <MQL?				X			
R6	OI	<b>Laboratory control samples (LCS):</b>							
		Were all COCs included in the LCS?				X			
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?				X			
		Were LCSs analyzed at required frequency?				X			
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?				X			
		Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?				X			5
		Was the LCSD RPD within QC limits?						X	
R7	OI	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>							
		Were the project/method specified analytes included in the MS and MSD?				X			
		Were MS/MSD analyzed at the appropriate frequency?				X			
		Were MS (and MSD, if applicable) %Rs within the laboratory QC Limits?					X		4
		Were the MS/MSD RPDs within laboratory QC limits?				X			
R8	OI	<b>Analytical duplicate data</b>							
		Were appropriate analytical duplicates analyzed for each matrix?				X			
		Were analytical duplicates analyzed at the appropriate frequency?				X			
		Were RPDs or relative standard deviations within the laboratory QC limits?				X			
R9	OI	<b>Method quantitation limits (MQLs):</b>							
		Are the MQLs for each method analyte included in the laboratory data package?				X			
		Do the MQLs correspond to the concentration of the lowest non-zero calibration				X			
		Are unadjusted MQLs and DCs included in the laboratory data package?					X		2
R10	OI	<b>Other problems/anomalies</b>							
		Are all known problems/anomalies/special conditions noted in this LRC and ER?				X			
		Was applicable and available technology used to lower the SDL to minimize the				X			
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package?				X			3



Laboratory Name:		Accutest Gulf Coast	LRC Date:		12/12/2012	
Project Name:		Quarterly Well Sampling, Parker	Laboratory Project Number:		TC20880	
Reviewer Name:		Anita Patel	Prep Batch Number(s):		GSS233, VX1673	
# <sup>1</sup>	A <sup>2</sup>	DESCRIPTION	YES	NO	NA <sup>3</sup>	NR <sup>4</sup> ER # <sup>5</sup>
S1	OI	<b>Initial calibration (ICAL)</b>				
		Were response factors and/or relative response factors for each analyte within QC limits?	X			
		Were percent RSDs or correlation coefficient criteria met?	X			
		Was the number of standards recommended in the method used for all analytes?	X			
		Were all points generated between the lowest and highest standard used to calculate the curve?	X			
		Are ICAL data available for all instruments used?	X			
		Has the initial calibration curve been verified using an appropriate second source standard?	X			
S2	OI	<b>Initial and continuing calibration verification (ICCV AND CCV) and continuing</b>				
		Was the CCV analyzed at the method-required frequency?	X			
		Were percent differences for each analyte within the method-required QC limits?	X			
		Was the ICAL curve verified for each analyte?	X			
		Was the absolute value of the analyte concentration in the inorganic CCB<MDL?			X	
S3	O	<b>Mass spectral tuning</b>				
		Was the appropriate compound for the method used for tuning?	X			
		Were ion abundance data within the method-required QC limits?	X			
S4	O	<b>Internal standards (IS)</b>				
		Were IS area counts and retention times within the method-required QC limits?	X			
S5	OI	<b>Raw data (NELAC Section 5.5.10)</b>				
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X			
		Were data associated with manual integrations flagged on the raw data?	X			
S6	O	<b>Dual column confirmation</b>				
		Did dual column confirmation results meet the method-required QC?			X	
S7	O	<b>Tentatively identified compounds (TICs):</b>				
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X	
S8	I	<b>Interference Check Sample (ICS) results</b>				
		Were percent recoveries within method QC limits?			X	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>				
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X	
S10	OI	<b>Method detection limit (MDL) studies</b>				
		Was a MDL study performed for each reported analyte?	X			
		Is the MDL either adjusted or supported by the analysis of DCSs?	X			5
S11	OI	<b>Proficiency test reports</b>				
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X			
S12	OI	<b>Standards documentation</b>				
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate source?	X			
S13	OI	<b>Compound/analyte identification procedures</b>				
		Are the procedures for compound/analyte identification documented?	X			
S14	OI	<b>Demonstration of analyst competency (DOC)</b>				
		Was DOC conducted consistent with NELAC Chapter 5?	X			
		Is documentation of the analyst's competency up-to-date and on file?	X			
S15	OI	<b>Verification/validation documentation for methods (NELAC Chapter 5)</b>				
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X			
S16	OI	<b>Laboratory standard operating procedures (SOPs)</b>				
		Are laboratory SOPs current and on file for each method performed?	X			

LABORATORY REVIEW CHECKLIST (continued): Exception Reports				
Laboratory Name:		Accutest Gulf Coast	LRC Date:	12/12/2012
Project Name:		Quarterly Well Sampling, Parker	Laboratory Project Number:	TC20880
Reviewer Name:	Anita Patel	Prep Batch Number(s):	GSS233, VX1673	
ER# <sup>1</sup>	Description			
1	For reporting purposes, the MQL is defined in the report as the RL. The unadjusted MQL/RL is reported in the method blank. The SDL is defined in the report as the MDL.			
2	For reporting purposes, the method blank represents the unadjusted MQL. The DCS is on file in the laboratory and is not included in the laboratory data package.			
3	The laboratory is NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package for analytes that are listed in the Texas Fields of Accreditation.			
4	All anomalies are discussed in the case narrative.			
5	The laboratory does not perform DCS analysis for Method RSKSOP-147/175. The components reported are not listed or do not have values in the Texas TRRP PCL tables.			

1ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on

## GC/MS Volatiles

## QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** TC20880

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VX1673-MB	X0087062.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20880-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.34	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l	
108-88-3	Toluene	ND	1.0	0.33	ug/l	
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	105% 72-122%
17060-07-0	1,2-Dichloroethane-D4	95% 68-124%
2037-26-5	Toluene-D8	99% 80-119%
460-00-4	4-Bromofluorobenzene	98% 72-126%

## Blank Spike Summary

Page 1 of 1

**Job Number:** TC20880

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VX1673-BS	X0087060.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20880-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	22.2	89	68-119
100-41-4	Ethylbenzene	25	22.1	88	71-117
108-88-3	Toluene	25	22.4	90	73-119
1330-20-7	Xylene (total)	75	67.7	90	74-119

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	101%	72-122%
17060-07-0	1,2-Dichloroethane-D4	99%	68-124%
2037-26-5	Toluene-D8	101%	80-119%
460-00-4	4-Bromofluorobenzene	92%	72-126%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** TC20880

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20864-1MS	X0087064.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1MSD	X0087065.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1	X0087063.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20880-1

CAS No.	Compound	TC20864-1 ug/l	Spike Q ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	1.0 U	25	23.0	92	22.4	90	3	68-119/12
100-41-4	Ethylbenzene	1.0 U	25	22.7	91	22.4	90	1	71-117/12
108-88-3	Toluene	1.0 U	25	22.9	92	22.5	90	2	73-119/13
1330-20-7	Xylene (total)	3.0 U	75	69.8	93	68.4	91	2	74-119/13

CAS No.	Surrogate Recoveries	MS	MSD	TC20864-1	Limits
1868-53-7	Dibromofluoromethane	103%	101%	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	98%	98%	96%	68-124%
2037-26-5	Toluene-D8	100%	100%	100%	80-119%
460-00-4	4-Bromofluorobenzene	91%	92%	98%	72-126%

\* = Outside of Control Limits.

## GC Volatiles

## QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** TC20880

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS233-MB	SS005056.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20880-1

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	ND	0.50	0.30	ug/l	
74-85-1	Ethene	ND	1.0	0.50	ug/l	
74-84-0	Ethane	ND	1.0	0.50	ug/l	
74-98-6	Propane	ND	1.5	0.75	ug/l	
75-28-5	Isobutane	ND	1.5	0.75	ug/l	
106-97-8	Butane	ND	1.5	0.75	ug/l	



## Blank Spike Summary

Page 1 of 1

**Job Number:** TC20880

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS233-BS	SS005054.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20880-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	21.5	16.2	75	68-139
74-85-1	Ethene	57.4	43.2	75	52-145
74-84-0	Ethane	43.3	47.1	109	68-131
74-98-6	Propane	60.6	60.5	100	69-131
75-28-5	Isobutane	72.5	70.4	97	72-131
106-97-8	Butane	76.6	73.6	96	66-128

\* = Outside of Control Limits.

# Matrix Spike Summary

Page 1 of 1

**Job Number:** TC20880

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20970-2MS <sup>a</sup>	SS005067.D	1	12/07/12	LT	n/a	n/a	GSS233
TC20970-2 <sup>a</sup>	SS005066.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20880-1

CAS No.	Compound	TC20970-2 ug/l	Spike Q ug/l	MS ug/l	MS %	Limits
74-82-8	Methane	105	21.5	95.8	-42* <sup>b</sup>	68-139
74-85-1	Ethene	ND	57.4	46.6	81	52-145
74-84-0	Ethane	4.71	43.3	46.7	97	68-131
74-98-6	Propane	ND	60.6	53.4	88	69-131
75-28-5	Isobutane	ND	72.5	61.8	85	72-131
106-97-8	Butane	ND	76.6	66.0	86	66-128

(a) Sample was not preserved to a pH < 2.

(b) Outside control limits due to high level in sample relative to spike amount.

\* = Outside of Control Limits.

## Duplicate Summary

Page 1 of 1

**Job Number:** TC20880

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20879-1DUP	SS005062.D	1	12/07/12	LT	n/a	n/a	GSS233
TC20879-1	SS005061.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20880-1

CAS No.	Compound	TC20879-1	DUP	Q	RPD	Limits
		ug/l	Q ug/l			
74-82-8	Methane	4.10	3.34		20	53
74-85-1	Ethene	1.0 U	ND		nc	27
74-84-0	Ethane	1.0 U	ND		nc	43
74-98-6	Propane	1.5 U	ND		nc	21
75-28-5	Isobutane	1.5 U	ND		nc	35
106-97-8	Butane	1.5 U	ND		nc	33

\* = Outside of Control Limits.

Lab #: 321080 Job #: 20030  
 Sample Name/Number: WW24-SMI-113012  
 Company: Oil Tracers, LLC  
 Date Sampled: 11/30/2012  
 Container: Dissolved Gas Bottle  
 Field/Site Name: Third Quarter Well Sampling  
 Location: Parker County, Texas  
 Formation/Depth:  
 Sampling Point:  
 Date Received: 12/05/2012 Date Reported: 2/01/2013

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{18}\text{O}$ ‰
Carbon Monoxide -----	nd			
Hydrogen Sulfide -----	na			
Helium -----	na			
Hydrogen -----	nd			
Argon -----	1.57			
Oxygen -----	16.65			
Nitrogen -----	79.76			
Carbon Dioxide -----	0.31			
Methane -----	1.66	-43.1	-127	
Ethane -----	0.0501			
Ethylene -----	nd			
Propane -----	0.0013			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	nd			
Iso-pentane -----	nd			
N-pentane -----	nd			
Hexanes + -----	nd			

## Remarks:

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.77

\*Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.



12/12/12

## Technical Report for

EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW13-Str

Accutest Job Number: TC20886

Sampling Date: 12/02/12


### Report to:

EarthCon Consultants  
4800 Sugar Grove Suite 420  
Stafford, TX 77477  
gfloreslovo@earthcon.com; djackson@jacksonsjoberg.com;  
mcpatton@rangeresources.com; escott@earthcon.com  
ATTN: Gabriela Floreslovo

Total number of pages in report: **26**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

  
Richard Rodriguez  
Laboratory Director

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366)  
LA (85695/04004) OK (211-035)

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Test results relate only to samples analyzed.

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Sample Summary

EarthCon Consultants

Job No: TC20886

Quarterly Well Sampling, Parker County, Texas  
Project No: 3rd Quarter / WW13-Str

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
TC20886-1	12/02/12	13:00	12/04/12	AQ	Ground Water	WW13-STR-120212



## SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** EarthCon Consultants

**Job No** TC20886

**Site:** Quarterly Well Sampling, Parker County, Texas

**Report Date** 12/12/2012 9:00:30 AM

1 Sample was collected on 12/02/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20886. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### Volatiles by GCMS By Method SW846 8260B

**Matrix** AQ

**Batch ID:** VK578

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20506-1MS, TC20506-1MSD were used as the QC samples indicated.

### Volatiles by GC By Method RSKSOP-147/175

**Matrix** AQ

**Batch ID:** GSS234

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC21021-1DUP, TC21021-2MS were used as the QC samples indicated.
- Matrix Spike Recovery for Ethane is outside control limits. Probable cause due to matrix interference.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used



Summary of Hits

**Job Number:** TC20886  
**Account:** EarthCon Consultants  
**Project:** Quarterly Well Sampling, Parker County, Texas  
**Collected:** 12/02/12



Lab Sample ID	Client Sample ID	Result/ Analyte	Qual	MQL	SDL	Units	Method
TC20886-1	WW13-STR-120212						
		Methane	5.64	0.025	0.015	mg/l	RSKSOP-147/175
		Ethane	0.779	0.050	0.025	mg/l	RSKSOP-147/175

Sample Results

Report of Analysis

## Report of Analysis

<b>Client Sample ID:</b>	WW13-STR-120212	<b>Date Sampled:</b>	12/02/12
<b>Lab Sample ID:</b>	TC20886-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K13199.D	1	12/06/12	EM	n/a	n/a	VK578
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

## Purgeable Aromatics

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2	Benzene	0.00034 U	0.0010	0.00034	mg/l	
108-88-3	Toluene	0.00033 U	0.0010	0.00033	mg/l	
100-41-4	Ethylbenzene	0.00032 U	0.0010	0.00032	mg/l	
1330-20-7	Xylene (total)	0.00087 U	0.0030	0.00087	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%		72-122%
17060-07-0	1,2-Dichloroethane-D4	107%		68-124%
2037-26-5	Toluene-D8	106%		80-119%
460-00-4	4-Bromofluorobenzene	102%		72-126%

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	WW13-STR-120212	<b>Date Sampled:</b>	12/02/12
<b>Lab Sample ID:</b>	TC20886-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	RSKSOP-147/175		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	SS005102.D	1	12/10/12	LT	n/a	n/a	GSS234
Run #2	SS005104.D	50	12/10/12	LT	n/a	n/a	GSS234

## RSK147 Special List

CAS No.	Compound	Result	MQL	SDL	Units	Q
74-82-8	Methane	5.64 <sup>a</sup>	0.025	0.015	mg/l	
74-85-1	Ethene	0.00050 U	0.0010	0.00050	mg/l	
74-84-0	Ethane	0.779 <sup>a</sup>	0.050	0.025	mg/l	
74-98-6	Propane	0.00075 U	0.0015	0.00075	mg/l	
75-28-5	Isobutane	0.00075 U	0.0015	0.00075	mg/l	
106-97-8	Butane	0.00075 U	0.0015	0.00075	mg/l	

(a) Result is from Run# 2

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Misc. Forms

5

### Custody Documents and Other Forms

---

Includes the following where applicable:

- Chain of Custody
- LRC Form



## CHAIN OF CUSTODY

PAGE 1 OF 1

10165 Harwin Dr, Ste 150 Houston, TX 77036  
TEL: 713-271-4700 FAX: 713-271-4770  
www.accutest.com

FED-EX Tracking #	Bottle Order Control #
Accutest Quote #	Accutest Job # <b>TC20886</b>
Requested Analyses	
Matrix Codes	
DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank	
LAB USE ONLY	

BTEX 0200B  
Butane, Ethane, Ethene, Isobutane, Methane,  
Propane by RSK-175

Client / Reporting Information		Project Information																																																																																																			
Company Name <b>EarthCon Consultants, Inc.</b>		Project Name: <b>Third Quarterly Well Sampling, Parker County, Texas</b>																																																																																																			
Street Address <b>4800 Sugar Grove Blvd., Suite 390</b>		Street																																																																																																			
City State Zip <b>Stafford TX 77477</b>		City State																																																																																																			
Project Contact <b>Gabriela Floreslovo</b>		Billing Information (if different from Report to) Company Name																																																																																																			
Phone # Fax # <b>281-201-3513</b>		Street Address																																																																																																			
Sampler(s) Name(s) <b>DA, SH, RM</b>		City State Zip																																																																																																			
Phone #		Client Purchase Order #																																																																																																			
Project Manager		Attention:																																																																																																			
Field ID / Point of Collection		Collection																																																																																																			
Accutest Sample #	Date	Time	Sampled By	Matrix	# of bottles	HCl	NaOH	ZnAcet	HNO3	H2SO4	DI Water	MECH	TSP	NaHCO3	ENCORE	OTHER																																																																																					
1	12/12/12	1300	VB	6W	6	2																																																																																															
Turnaround Time (Business days)																	Data Deliverable Information																	Comments / Special Instructions																																																																			
<input checked="" type="checkbox"/> Standard <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 4 Day RUSH <input type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day EMERGENCY Emergency & Rush T/A data available VIA Lablink																	Approved By (Accutest PM): / Date:  <b>12-4-12 0922@</b>																	<input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> FULT1 (Level 3+4) <input type="checkbox"/> REDT1 (Level 3+4) <input type="checkbox"/> Commercial "C"  Commercial "A" = Results Only Commercial "B" = Results + QC Summary Commercial "C" = Results + QC & Surrogate Summary																	<input checked="" type="checkbox"/> TRRP <input type="checkbox"/> EDD Format <input type="checkbox"/> Other _____																																																		
Relinquished by Sampler: <b>3</b>																	Date Time: <b>12/4/12 1535</b>																	Received By: <b>3</b>																	Relinquished By: <b>4</b>																	Date Time:																	Received By: <b>2</b>																
Relinquished by Sampler: <b>5</b>																	Date Time:																	Received By: <b>5</b>																	Relinquished By:																	Date Time:																	Received By: <b>4</b>																
Custody Seal #																	<input type="checkbox"/> Intact <input type="checkbox"/> Not intact																	Preserved where applicable <input type="checkbox"/>																	On Ice <input type="checkbox"/>																	Cooler Temp.																																	

TC20886: Chain of Custody

Page 1 of 4

**Accutest Job Number:** TC20886      **Client:** EARTHCON CONSULTANTS      **Project:** 3RD QTR WELL SAMPLING,PARKER COUNTY,T  
**Date / Time Received:** 12/4/2012      **Delivery Method:** Client      **Airbill #s:** \_\_\_\_\_  
**No. Coolers:** 1      **Therm ID:** IR6      **Temp Adjustment Factor:** 0.2  
**Cooler Temps (Initial/Adjusted):** #1: (2.2/2.4)

<b>Cooler Security</b>		<b>Y or N</b>		<b>Y or N</b>	
1. Custody Seals Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Cooler Temperature</b>		<b>Y or N</b>			
1. Temp criteria achieved:	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
2. Cooler temp verification:	Infrared Gun				
3. Cooler media:	Ice (bag)				
<b>Quality Control Preservation</b>	<b>Y</b>	<b>or</b>	<b>N</b>	<b>N/A</b>	<b>WTB STB</b>
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. Trip Blank listed on COC:	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Samples preserved properly:	<input checked="" type="checkbox"/>		<input type="checkbox"/>		
4. VOCs headspace free:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	

<b>Sample Integrity - Documentation</b>		<b>Y or N</b>	
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Container labeling complete:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>Sample Integrity - Condition</b>		<b>Y or N</b>	
1. Sample recvd within HT:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. All containers accounted for:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Condition of sample:	Intact		
<b>Sample Integrity - Instructions</b>		<b>Y or N</b>	<b>N/A</b>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments -Received trip blank not listed on COC.

**TC20886: Chain of Custody**

**Page 2 of 4**

**Accutest Job Number:** TC20886

**CSR:** Elessa Sommers

**Response Date:** 12/5/2012

**Response:** Trip blank is on separate report.

5.1

5

**TC20886: Chain of Custody**  
**Page 3 of 4**



## Sample Receipt Log

Page 3 of 3

**Job #:** TC20886

**Date / Time Received:** 12/4/2012 9:22:00 AM

**Initials:** CH

**Client:** EARTHCON CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	pH	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20886-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20886-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20886-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20886-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20886-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20886-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4

 5.1  
5

**TC20886: Chain of Custody**
**Page 4 of 4**

# Appendix A Laboratory Data Package Cover Page

TC20886 This data package consists of

- ☐ This signature page, the laboratory review checklist, and the following reportable data:
- ☐ R1 Field chain-of-custody documentation;
- ☐ R2 Sample identification cross-reference;
- ☐ R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - a) Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
  - b) dilution factors,
  - c) preparation methods,
  - d) cleanup methods, and
  - e) if required for the project, tentatively identified compounds (TICs).
- ☐ R4 Surrogate recovery data including:
  - a) Calculated recovery (%R), and
  - b) The laboratory's surrogate QC limits.
- ☐ R5 Test reports/summary forms for blank samples;
- ☐ R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - a) LCS spiking amounts,
  - b) Calculated %R for each analyte, and
  - c) The laboratory's LCS QC limits.
- ☐ R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - a) Samples associated with the MS/MSD clearly identified,
  - b) MS/MSD spiking amounts,
  - c) Concentration of each MS/MSD analyte measured in the parent and
  - d) Calculated %Rs and relative percent differences (RPDs), and
  - e) The laboratory's MS/MSD QC limits
- ☐ R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - a) The amount of analyte measured in the duplicate,
  - b) The calculated RPD, and
  - c) The laboratory's QC limits for analytical duplicates.
- ☐ R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each
- ☐ R10 Other problems or anomalies.


The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

**Release Statement:** I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Report. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld.

**Check, if applicable:** This laboratory meets an exception under 30 TAC&25.6 and was last inspection by

[ ] [X] TCEQ or [ ] \_\_\_\_\_ on April 2011. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

## QA Manager

Name (Printed)	Signature	Official Title (printed)	Date
Richard Rodriguez		Laboratory Director	12/12/2012
_____	_____	_____	_____

LABORATORY REVIEW CHECKLIST: REPORTABLE DATA									
Laboratory Name:		Accutest Gulf Coast		LRC Date:		12/12/2012			
Project Name:		Quarterly Well Sampling, Parker County, Texas		Laboratory Project Number:		TC20886			
Reviewer Name:		Anita Patel		Prep Batch Number(s):		GSS234, VK578			
# <sup>1</sup>	A <sup>2</sup>	DESCRIPTION				YES	NO	NA <sup>3</sup>	NR <sup>4</sup>   ER # <sup>5</sup>
R1	OI	<b>CHAIN-OF-CUSTODY (C-O-C):</b>							
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?				X			
		Were all departures from standard conditions described in an exception report?				X			
R2	OI	<b>Sample and quality control (QC) identification</b>							
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?				X			
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?				X			
R3	OI	<b>Test reports</b>							
		Were samples prepared and analyzed within holding times?				X			
		Other than those results <MQL, were all other raw values bracketed by calibration standards?				X			
		Were calculations checked by a peer or supervisor?				X			
		Were all analyte identifications checked by a peer or supervisor?				X			
		Were sample detection limits reported for all analytes not detected?				X			
		Were all results for soil and sediment samples reported on a dry weight basis?						X	
		Were % moisture (or solids) reported for all soil and sediment samples?						X	
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?						X	
		If required for the project, are TIC's reported?						X	
R4	O	<b>Surrogate recovery data</b>							
		Were surrogates added prior to extraction?				X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?				X			
R5	OI	<b>Test reports/summary forms for blank samples</b>							
		Were appropriate type(s) of blanks analyzed?				X			
		Were blanks analyzed at the appropriate frequency?				X			
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?				X			
		Were blank concentrations <MQL?				X			
R6	OI	<b>Laboratory control samples (LCS):</b>							
		Were all COCs included in the LCS?				X			
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?				X			
		Were LCSs analyzed at required frequency?				X			
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?				X			
		Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?				X			5
		Was the LCSD RPD within QC limits?						X	
R7	OI	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>							
		Were the project/method specified analytes included in the MS and MSD?				X			
		Were MS/MSD analyzed at the appropriate frequency?				X			
		Were MS (and MSD, if applicable) %Rs within the laboratory QC Limits?					X		4
		Were the MS/MSD RPDs within laboratory QC limits?				X			
R8	OI	<b>Analytical duplicate data</b>							
		Were appropriate analytical duplicates analyzed for each matrix?				X			
		Were analytical duplicates analyzed at the appropriate frequency?				X			
		Were RPDs or relative standard deviations within the laboratory QC limits?				X			
R9	OI	<b>Method quantitation limits (MQLs):</b>							
		Are the MQLs for each method analyte included in the laboratory data package?				X			
		Do the MQLs correspond to the concentration of the lowest non-zero calibration				X			
		Are unadjusted MQLs and DCSSs included in the laboratory data package?					X		2
R10	OI	<b>Other problems/anomalies</b>							
		Are all known problems/anomalies/special conditions noted in this LRC and ER?				X			
		Was applicable and available technology used to lower the SDL to minimize the				X			
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package?				X			3

Laboratory Name:		Accutest Gulf Coast	LRC Date:		12/12/2012	
Project Name:		Quarterly Well Sampling, Parker	Laboratory Project Number:		TC20886	
Reviewer Name:		Anita Patel	Prep Batch Number(s):		GSS234, VK578	
# <sup>1</sup>	A <sup>2</sup>	DESCRIPTION	YES	NO	NA <sup>3</sup>	NR <sup>4</sup> ER # <sup>5</sup>
S1	OI	<b>Initial calibration (ICAL)</b>				
		Were response factors and/or relative response factors for each analyte within QC limits?	X			
		Were percent RSDs or correlation coefficient criteria met?	X			
		Was the number of standards recommended in the method used for all analytes?	X			
		Were all points generated between the lowest and highest standard used to calculate the curve?	X			
		Are ICAL data available for all instruments used?	X			
		Has the initial calibration curve been verified using an appropriate second source standard?	X			
S2	OI	<b>Initial and continuing calibration verification (ICCV AND CCV) and continuing</b>				
		Was the CCV analyzed at the method-required frequency?	X			
		Were percent differences for each analyte within the method-required QC limits?	X			
		Was the ICAL curve verified for each analyte?	X			
		Was the absolute value of the analyte concentration in the inorganic CCB<MDL?			X	
S3	O	<b>Mass spectral tuning</b>				
		Was the appropriate compound for the method used for tuning?	X			
		Were ion abundance data within the method-required QC limits?	X			
S4	O	<b>Internal standards (IS)</b>				
		Were IS area counts and retention times within the method-required QC limits?	X			
S5	OI	<b>Raw data (NELAC Section 5.5.10)</b>				
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X			
		Were data associated with manual integrations flagged on the raw data?	X			
S6	O	<b>Dual column confirmation</b>				
		Did dual column confirmation results meet the method-required QC?			X	
S7	O	<b>Tentatively identified compounds (TICs):</b>				
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X	
S8	I	<b>Interference Check Sample (ICS) results</b>				
		Were percent recoveries within method QC limits?			X	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>				
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X	
S10	OI	<b>Method detection limit (MDL) studies</b>				
		Was a MDL study performed for each reported analyte?	X			
		Is the MDL either adjusted or supported by the analysis of DCSSs?	X			5
S11	OI	<b>Proficiency test reports</b>				
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X			
S12	OI	<b>Standards documentation</b>				
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate source?	X			
S13	OI	<b>Compound/analyte identification procedures</b>				
		Are the procedures for compound/analyte identification documented?	X			
S14	OI	<b>Demonstration of analyst competency (DOC)</b>				
		Was DOC conducted consistent with NELAC Chapter 5?	X			
		Is documentation of the analyst's competency up-to-date and on file?	X			
S15	OI	<b>Verification/validation documentation for methods (NELAC Chapter 5)</b>				
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X			
S16	OI	<b>Laboratory standard operating procedures (SOPs)</b>				
		Are laboratory SOPs current and on file for each method performed?	X			

LABORATORY REVIEW CHECKLIST (continued): Exception Reports			
Laboratory Name:	Accutest Gulf Coast	LRC Date:	12/12/2012
Project Name:	Quarterly Well Sampling, Parker	Laboratory Project Number:	TC20886
Reviewer Name:	Anita Patel	Prep Batch Number(s):	GSS234, VK578
ER# <sup>1</sup>	Description		
1	For reporting purposes, the MQL is defined in the report as the RL. The unadjusted MQL/RL is reported in the method blank. The SDL is defined in the report as the MDL.		
2	For reporting purposes, the method blank represents the unadjusted MQL. The DCS is on file in the laboratory and is not included in the laboratory data package.		
3	The laboratory is NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package for analytes that are listed in the Texas Fields of Accreditation.		
4	All anomalies are discussed in the case narrative.		
5	The laboratory does not perform DCS analysis for Method RKSOP-147/175. The components reported are not listed or do not have values in the Texas TRRP PCL tables.		

1ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on

## GC/MS Volatiles

## QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** TC20886

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VK578-MB	K13177.D	1	12/06/12	EM	n/a	n/a	VK578

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20886-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.34	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l	
108-88-3	Toluene	ND	1.0	0.33	ug/l	
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	107% 72-122%
17060-07-0	1,2-Dichloroethane-D4	105% 68-124%
2037-26-5	Toluene-D8	107% 80-119%
460-00-4	4-Bromofluorobenzene	103% 72-126%

## Blank Spike Summary

Page 1 of 1

**Job Number:** TC20886

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VK578-BS	K13175.D	1	12/06/12	EM	n/a	n/a	VK578

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20886-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	23.5	94	68-119
100-41-4	Ethylbenzene	25	23.4	94	71-117
108-88-3	Toluene	25	23.0	92	73-119
1330-20-7	Xylene (total)	75	71.7	96	74-119

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	103%	68-124%
2037-26-5	Toluene-D8	105%	80-119%
460-00-4	4-Bromofluorobenzene	101%	72-126%

\* = Outside of Control Limits.



# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** TC20886

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20506-1MS	K13179.D	1	12/06/12	EM	n/a	n/a	VK578
TC20506-1MSD	K13180.D	1	12/06/12	EM	n/a	n/a	VK578
TC20506-1	K13178.D	1	12/06/12	EM	n/a	n/a	VK578

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20886-1

CAS No.	Compound	TC20506-1 ug/l	Spike Q ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	25	23.4	94	23.1	92	1	68-119/12
100-41-4	Ethylbenzene	ND	25	22.9	92	22.6	90	1	71-117/12
108-88-3	Toluene	ND	25	23.0	92	22.1	88	4	73-119/13
1330-20-7	Xylene (total)	ND	75	71.6	95	69.3	92	3	74-119/13

CAS No.	Surrogate Recoveries	MS	MSD	TC20506-1	Limits
1868-53-7	Dibromofluoromethane	108%	108%	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	103%	105%	104%	68-124%
2037-26-5	Toluene-D8	107%	105%	106%	80-119%
460-00-4	4-Bromofluorobenzene	103%	104%	104%	72-126%

\* = Outside of Control Limits.

## GC Volatiles

## QC Data Summaries

---

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** TC20886

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS234-MB	SS005099.D	1	12/10/12	LT	n/a	n/a	GSS234

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20886-1

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	ND	0.50	0.30	ug/l	
74-85-1	Ethene	ND	1.0	0.50	ug/l	
74-84-0	Ethane	ND	1.0	0.50	ug/l	
74-98-6	Propane	ND	1.5	0.75	ug/l	
75-28-5	Isobutane	ND	1.5	0.75	ug/l	
106-97-8	Butane	ND	1.5	0.75	ug/l	

## Blank Spike Summary

Page 1 of 1

**Job Number:** TC20886

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS234-BS	SS005096.D	1	12/10/12	LT	n/a	n/a	GSS234

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20886-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	21.5	20.9	97	68-139
74-85-1	Ethene	57.4	43.4	76	52-145
74-84-0	Ethane	43.3	49.3	114	68-131
74-98-6	Propane	60.6	59.3	98	69-131
75-28-5	Isobutane	72.5	69.9	96	72-131
106-97-8	Butane	76.6	73.6	96	66-128

\* = Outside of Control Limits.

## Matrix Spike Summary

Page 1 of 1

**Job Number:** TC20886

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC21021-2MS	SS005113.D	1	12/10/12	LT	n/a	n/a	GSS234
TC21021-2	SS005112.D	1	12/10/12	LT	n/a	n/a	GSS234

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20886-1

CAS No.	Compound	TC21021-2 ug/l	Spike Q ug/l	MS ug/l	MS %	Limits
74-82-8	Methane	1.49	21.5	24.3	106	68-139
74-85-1	Ethene	ND	57.4	55.4	97	52-145
74-84-0	Ethane	ND	43.3	64.1	148*	68-131
74-98-6	Propane	ND	60.6	75.7	125	69-131
75-28-5	Isobutane	ND	72.5	87.2	120	72-131
106-97-8	Butane	ND	76.6	93.9	123	66-128

\* = Outside of Control Limits.

## Duplicate Summary

Page 1 of 1

**Job Number:** TC20886

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC21021-1DUP	SS005111.D	1	12/10/12	LT	n/a	n/a	GSS234
TC21021-1	SS005110.D	1	12/10/12	LT	n/a	n/a	GSS234

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20886-1

CAS No.	Compound	TC21021-1		Q	RPD	Limits
		ug/l	DUP ug/l			
74-82-8	Methane	0.88	0.86		2	53
74-85-1	Ethene	ND	ND		nc	27
74-84-0	Ethane	ND	ND		nc	43
74-98-6	Propane	ND	ND		nc	21
75-28-5	Isobutane	ND	ND		nc	35
106-97-8	Butane	ND	ND		nc	33

\* = Outside of Control Limits.

Lab #: 321090 Job #: 20030  
 Sample Name/Number: WW13-Str-120212  
 Company: Oil Tracers, LLC  
 Date Sampled: 12/02/2012  
 Container: Dissolved Gas Bottle  
 Field/Site Name: Third Quarter Well Sampling  
 Location: Parker County, Texas  
 Formation/Depth:  
 Sampling Point:  
 Date Received: 12/05/2012 Date Reported: 2/01/2013

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{18}\text{O}$ ‰
Carbon Monoxide -----	nd			
Hydrogen Sulfide -----	na			
Helium -----	na			
Hydrogen -----	nd			
Argon -----	1.05			
Oxygen -----	0.089			
Nitrogen -----	57.10			
Carbon Dioxide -----	0.30			
Methane -----	39.39	-46.16	-181.3	
Ethane -----	2.07	-31.8		
Ethylene -----	nd			
Propane -----	0.0006			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	0.0006			
Iso-pentane -----	nd			
N-pentane -----	nd			
Hexanes + -----	0.0006			

**Remarks:**

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.67

\*Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

\*\* Ethane isotopes obtained online via GC-C-IRMS

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.



12/12/12

## Technical Report for

EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW18-Str

Accutest Job Number: TC20885

Sampling Date: 12/02/12


Report to:

EarthCon Consultants  
4800 Sugar Grove Suite 420  
Stafford, TX 77477  
gfloreslovo@earthcon.com; djackson@jacksonsjoberg.com;  
mcpatton@rangeresources.com; escott@earthcon.com  
ATTN: Gabriela Floreslovo

Total number of pages in report: **30**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

  
Richard Rodriguez  
Laboratory Director

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366)  
LA (85695/04004) OK (211-035)

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Test results relate only to samples analyzed.



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Sample Summary

EarthCon Consultants

Job No: TC20885

Quarterly Well Sampling, Parker County, Texas  
Project No: 3rd Quarter / WW18-Str

Sample Number	Collected		Matrix			Client Sample ID
	Date	Time By	Received	Code	Type	
TC20885-1	12/02/12	11:50	12/04/12	AQ	Ground Water	WW18-STR-120212



## SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** EarthCon Consultants

**Job No** TC20885

**Site:** Quarterly Well Sampling, Parker County, Texas

**Report Date** 12/12/2012 1:52:04 PM

1 Sample was collected on 12/02/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20885. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### Volatiles by GCMS By Method SW846 8260B

**Matrix** AQ

**Batch ID:** VK578

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20506-1MS, TC20506-1MSD were used as the QC samples indicated.

### Volatiles by GC By Method RSKSOP-147/175

**Matrix** AQ

**Batch ID:** GSS233

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20879-1DUP, TC20970-2MS were used as the QC samples indicated.
- TC20970-2MS: Sample was not preserved to a pH < 2.

**Matrix** AQ

**Batch ID:** GSS234

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC21021-1DUP, TC21021-2MS were used as the QC samples indicated.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used

Summary of Hits

**Job Number:** TC20885  
**Account:** EarthCon Consultants  
**Project:** Quarterly Well Sampling, Parker County, Texas  
**Collected:** 12/02/12



Lab Sample ID	Client Sample ID	Result/ Qual	ML	SDL	Units	Method
TC20885-1	WW18-STR-120212					
Methane		1.26	0.010	0.0060	mg/l	RSKSOP-147/175
Ethane		0.0921	0.0010	0.00050	mg/l	RSKSOP-147/175

## Sample Results

## Report of Analysis

## Report of Analysis

<b>Client Sample ID:</b>	WW18-STR-120212	<b>Date Sampled:</b>	12/02/12
<b>Lab Sample ID:</b>	TC20885-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	K13198.D	1	12/06/12	EM	n/a	n/a	VK578
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

## Purgeable Aromatics

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2	Benzene	0.00034 U	0.0010	0.00034	mg/l	
108-88-3	Toluene	0.00033 U	0.0010	0.00033	mg/l	
100-41-4	Ethylbenzene	0.00032 U	0.0010	0.00032	mg/l	
1330-20-7	Xylene (total)	0.00087 U	0.0030	0.00087	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	106%		72-122%
17060-07-0	1,2-Dichloroethane-D4	106%		68-124%
2037-26-5	Toluene-D8	105%		80-119%
460-00-4	4-Bromofluorobenzene	104%		72-126%

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	WW18-STR-120212	<b>Date Sampled:</b>	12/02/12
<b>Lab Sample ID:</b>	TC20885-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	RSKSOP-147/175		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	SS005077.D	1	12/07/12	LT	n/a	n/a	GSS233
Run #2	SS005101.D	20	12/10/12	LT	n/a	n/a	GSS234

## RSK147 Special List

CAS No.	Compound	Result	MQL	SDL	Units	Q
74-82-8	Methane	1.26 <sup>a</sup>	0.010	0.0060	mg/l	
74-85-1	Ethene	0.00050 U	0.0010	0.00050	mg/l	
74-84-0	Ethane	0.0921	0.0010	0.00050	mg/l	
74-98-6	Propane	0.00075 U	0.0015	0.00075	mg/l	
75-28-5	Isobutane	0.00075 U	0.0015	0.00075	mg/l	
106-97-8	Butane	0.00075 U	0.0015	0.00075	mg/l	

(a) Result is from Run# 2

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Misc. Forms

5

### Custody Documents and Other Forms

---

Includes the following where applicable:

- Chain of Custody
- LRC Form





## CHAIN OF CUSTODY

PAGE 1 OF 1

10165 Harwin Dr, Ste 150 Houston, TX 77036  
TEL: 713-271-4700 FAX: 713-271-4770  
www.accutest.com

FED-EX Tracking #		Bottle Order Control #	
Accutest Quote #		Accutest Job # <b>TC20885</b>	
Client / Reporting Information		Project Information	
Company Name <b>EarthCon Consultants, Inc.</b>		Project Name: <b>Third Quarterly Well Sampling, Parker County, Texas</b>	
Street Address <b>4800 Sugar Grove Blvd., Suite 390</b>		Street	
City State Zip <b>Stafford TX 77477</b>		City State	
Project Contact <b>Gabriela Floreslovo</b>		Project #	
Phone # Fax # <b>281-201-3513</b>		Client Purchase Order #	
Sampler(s) Name(s) <b>JD, SH RM</b>		Project Manager	
Field ID / Point of Collection <b>1 W18-ST-120212</b>		Attention:	
Date Time <b>12/2/12 1150</b>		Sampled By Matrix <b>JB GW</b>	
Number of bottles <b>6</b>		Number of preserved bottles <b>2</b>	
Collection		BTEX 8200B	
Date Time		Butane, Ethane, Ethene, Isobutane, Methane, Propane by RSK-175	
Sampled By Matrix		Matrix Codes	
# of bottles		LAB USE ONLY	
HCl NaOH ZnAcOH HNO3 H2SO4 NONE DI Water MCH TSP NH4OH ENCORE OTHER		DW - Drinking Water GW - Ground Water WW - Water SW - Surface Water SO - Soil SL - Sludge SED - Sediment OI - Oil LIQ - Other Liquid AIR - Air SOL - Other Solid WP - Wipe FB - Field Blank	
Turnaround Time (Business days)		Data Deliverable Information	
Comments / Special Instructions		Comments / Special Instructions	
Standard 5 Day RUSH 4 Day RUSH 3 Day RUSH 2 Day RUSH 1 Day EMERGENCY Emergency & Rush T/A data available VIA Lablink		Approved By (Accutest PM): / Date: <b>12-4-12 or 22</b>	
Commercial "A" (Level 1) Commercial "B" (Level 2) FULT1 (Level 3+4) REDT1 (Level 3+4) Commercial "C"		Commercial "A" = Results Only Commercial "B" = Results + QC Summary Commercial "C" = Results + QC & Surrogate Summary	
Relinquished by Sampler: <b>3</b>		Relinquished By: <b>2</b>	
Date Time: <b>12/2/12 1150</b>		Date Time:	
Relinquished by Sampler: <b>3</b>		Relinquished By: <b>3</b>	
Date Time:		Date Time:	
Relinquished by: <b>5</b>		Relinquished By: <b>5</b>	
Date Time:		Date Time:	
Custody Seal #		Intact Not Intact	
Preserved where applicable		On Ice Cooler Temp.	

TC20885: Chain of Custody

Page 1 of 4

**Accutest Job Number:** TC20885      **Client:** EARTHCON CONSULTANTS      **Project:** 3RD QTR WELL SAMPLING,PARKER COUNTY,T  
**Date / Time Received:** 12/4/2012      **Delivery Method:** Client      **Airbill #'s:** \_\_\_\_\_  
**No. Coolers:** 1      **Therm ID:** IR6      **Temp Adjustment Factor:** 0.2  
**Cooler Temps (Initial/Adjusted):** #1: (2.2/2.4)

<b>Cooler Security</b>		<b>Y or N</b>		<b>Y or N</b>	
1. Custody Seals Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Cooler Temperature</b>		<b>Y or N</b>			
1. Temp criteria achieved:	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
2. Cooler temp verification:	Infrared Gun				
3. Cooler media:	Ice (bag)				
<b>Quality Control Preservation</b>		<b>Y or N</b>	<b>N/A</b>	<b>WTB</b>	<b>STB</b>
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Trip Blank listed on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
3. Samples preserved properly:	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
4. VOCs headspace free:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

<b>Sample Integrity - Documentation</b>		<b>Y or N</b>	
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Container labeling complete:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>Sample Integrity - Condition</b>		<b>Y or N</b>	
1. Sample recvd within HT:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. All containers accounted for:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Condition of sample:	Intact		
<b>Sample Integrity - Instructions</b>		<b>Y or N</b>	<b>N/A</b>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments -Received tripblank not listed on COC.

**Accutest Job Number:** TC20885**CSR:** Elessa Sommers**Response Date:** 12/5/2012**Response:** Trip blank is on separate report.

5.1

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**TC20885: Chain of Custody**  
**Page 3 of 4**

## Sample Receipt Log

Page 3 of 3

**Job #:** TC20885

**Date / Time Received:** 12/4/2012 9:22:00 AM

**Initials:** CH

**Client:** EARTHCON CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	pH	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20885-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20885-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20885-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20885-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20885-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20885-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4

 5.1  
 5

**TC20885: Chain of Custody**
**Page 4 of 4**

# Appendix A Laboratory Data Package Cover Page

TC20885 This data package consists of

- ☐ This signature page, the laboratory review checklist, and the following reportable data:
- ☐ R1 Field chain-of-custody documentation;
- ☐ R2 Sample identification cross-reference;
- ☐ R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - a) Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
  - b) dilution factors,
  - c) preparation methods,
  - d) cleanup methods, and
  - e) if required for the project, tentatively identified compounds (TICs).
- ☐ R4 Surrogate recovery data including:
  - a) Calculated recovery (%R), and
  - b) The laboratory's surrogate QC limits.
- ☐ R5 Test reports/summary forms for blank samples;
- ☐ R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - a) LCS spiking amounts,
  - b) Calculated %R for each analyte, and
  - c) The laboratory's LCS QC limits.
- ☐ R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - a) Samples associated with the MS/MSD clearly identified,
  - b) MS/MSD spiking amounts,
  - c) Concentration of each MS/MSD analyte measured in the parent and
  - d) Calculated %Rs and relative percent differences (RPDs), and
  - e) The laboratory's MS/MSD QC limits
- ☐ R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - a) The amount of analyte measured in the duplicate,
  - b) The calculated RPD, and
  - c) The laboratory's QC limits for analytical duplicates.
- ☐ R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each
- ☐ R10 Other problems or anomalies.


The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

**Release Statement:** I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Report. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld.

**Check, if applicable:** This laboratory meets an exception under 30 TAC&25.6 and was last inspection by

[ ] [X] TCEQ or [ ] \_\_\_\_\_ on April 2011. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

## QA Manager

Name (Printed)	Signature	Official Title (printed)	Date
Richard Rodriguez		Laboratory Director	12/12/2012
_____			_____

LABORATORY REVIEW CHECKLIST: REPORTABLE DATA									
Laboratory Name:		Accutest Gulf Coast		LRC Date:		12/12/2012			
Project Name:		Quarterly Well Sampling, Parker County, Texas		Laboratory Project Number:		TC20885			
Reviewer Name:		Anita Patel		Prep Batch Number(s):		GSS233, VK578			
# <sup>1</sup>	A <sup>2</sup>	DESCRIPTION				YES	NO	NA <sup>3</sup>	NR <sup>4</sup>   ER # <sup>5</sup>
R1	OI	<b>CHAIN-OF-CUSTODY (C-O-C):</b>							
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?				X			
		Were all departures from standard conditions described in an exception report?				X			
R2	OI	<b>Sample and quality control (QC) identification</b>							
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?				X			
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?				X			
R3	OI	<b>Test reports</b>							
		Were samples prepared and analyzed within holding times?				X			
		Other than those results <MQL, were all other raw values bracketed by calibration standards?				X			
		Were calculations checked by a peer or supervisor?				X			
		Were all analyte identifications checked by a peer or supervisor?				X			
		Were sample detection limits reported for all analytes not detected?				X			
		Were all results for soil and sediment samples reported on a dry weight basis?						X	
		Were % moisture (or solids) reported for all soil and sediment samples?						X	
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?						X	
		If required for the project, are TIC's reported?						X	
R4	O	<b>Surrogate recovery data</b>							
		Were surrogates added prior to extraction?				X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?				X			
R5	OI	<b>Test reports/summary forms for blank samples</b>							
		Were appropriate type(s) of blanks analyzed?				X			
		Were blanks analyzed at the appropriate frequency?				X			
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?				X			
		Were blank concentrations <MQL?				X			
R6	OI	<b>Laboratory control samples (LCS):</b>							
		Were all COCs included in the LCS?				X			
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?				X			
		Were LCSs analyzed at required frequency?				X			
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?				X			
		Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?				X			4
		Was the LCSD RPD within QC limits?						X	
R7	OI	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>							
		Were the project/method specified analytes included in the MS and MSD?				X			
		Were MS/MSD analyzed at the appropriate frequency?				X			
		Were MS (and MSD, if applicable) %Rs within the laboratory QC Limits?				X			
		Were the MS/MSD RPDs within laboratory QC limits?				X			
R8	OI	<b>Analytical duplicate data</b>							
		Were appropriate analytical duplicates analyzed for each matrix?				X			
		Were analytical duplicates analyzed at the appropriate frequency?				X			
		Were RPDs or relative standard deviations within the laboratory QC limits?				X			
R9	OI	<b>Method quantitation limits (MQLs):</b>							
		Are the MQLs for each method analyte included in the laboratory data package?				X			
		Do the MQLs correspond to the concentration of the lowest non-zero calibration				X			
		Are unadjusted MQLs and DCSSs included in the laboratory data package?					X		2
R10	OI	<b>Other problems/anomalies</b>							
		Are all known problems/anomalies/special conditions noted in this LRC and ER?				X			
		Was applicable and available technology used to lower the SDL to minimize the				X			
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package?				X			3

Laboratory Name:		Accutest Gulf Coast	LRC Date:		12/12/2012	
Project Name:		Quarterly Well Sampling, Parker	Laboratory Project Number:		TC20885	
Reviewer Name:		Anita Patel	Prep Batch Number(s):		GSS233, VK578	
# <sup>1</sup>	A <sup>2</sup>	DESCRIPTION	YES	NO	NA <sup>3</sup>	NR <sup>4</sup> ER # <sup>5</sup>
S1	OI	<b>Initial calibration (ICAL)</b>				
		Were response factors and/or relative response factors for each analyte within QC limits?	X			
		Were percent RSDs or correlation coefficient criteria met?	X			
		Was the number of standards recommended in the method used for all analytes?	X			
		Were all points generated between the lowest and highest standard used to calculate the curve?	X			
		Are ICAL data available for all instruments used?	X			
		Has the initial calibration curve been verified using an appropriate second source standard?	X			
S2	OI	<b>Initial and continuing calibration verification (ICCV AND CCV) and continuing</b>				
		Was the CCV analyzed at the method-required frequency?	X			
		Were percent differences for each analyte within the method-required QC limits?	X			
		Was the ICAL curve verified for each analyte?	X			
		Was the absolute value of the analyte concentration in the inorganic CCB<MDL?			X	
S3	O	<b>Mass spectral tuning</b>				
		Was the appropriate compound for the method used for tuning?	X			
		Were ion abundance data within the method-required QC limits?	X			
S4	O	<b>Internal standards (IS)</b>				
		Were IS area counts and retention times within the method-required QC limits?	X			
S5	OI	<b>Raw data (NELAC Section 5.5.10)</b>				
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X			
		Were data associated with manual integrations flagged on the raw data?	X			
S6	O	<b>Dual column confirmation</b>				
		Did dual column confirmation results meet the method-required QC?			X	
S7	O	<b>Tentatively identified compounds (TICs):</b>				
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X	
S8	I	<b>Interference Check Sample (ICS) results</b>				
		Were percent recoveries within method QC limits?			X	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>				
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X	
S10	OI	<b>Method detection limit (MDL) studies</b>				
		Was a MDL study performed for each reported analyte?	X			
		Is the MDL either adjusted or supported by the analysis of DCSS?	X			4
S11	OI	<b>Proficiency test reports</b>				
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X			
S12	OI	<b>Standards documentation</b>				
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate source?	X			
S13	OI	<b>Compound/analyte identification procedures</b>				
		Are the procedures for compound/analyte identification documented?	X			
S14	OI	<b>Demonstration of analyst competency (DOC)</b>				
		Was DOC conducted consistent with NELAC Chapter 5?	X			
		Is documentation of the analyst's competency up-to-date and on file?	X			
S15	OI	<b>Verification/validation documentation for methods (NELAC Chapter 5)</b>				
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X			
S16	OI	<b>Laboratory standard operating procedures (SOPs)</b>				
		Are laboratory SOPs current and on file for each method performed?	X			

LABORATORY REVIEW CHECKLIST (continued): Exception Reports			
Laboratory Name:		Accutest Gulf Coast	LRC Date:
Project Name:		Quarterly Well Sampling, Parker	12/12/2012
Reviewer Name:		Anita Patel	Laboratory Project Number:
			TC20885
		Prep Batch Number(s):	GSS233, VK578
ER#	Description		
1	For reporting purposes, the MQL is defined in the report as the RL. The unadjusted MQL/RL is reported in the method blank. The SDL is defined in the report as the MDL.		
2	For reporting purposes, the method blank represents the unadjusted MQL. The DCS is on file in the laboratory and is not included in the laboratory data package.		
3	The laboratory is NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package for analytes that are listed in the Texas Fields of Accreditation.		
4	The laboratory does not perform DCS analysis for Method RSKSOP-147/175. The components reported are not listed or do not have values in the Texas TRRP PCL tables.		

1ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on



## GC/MS Volatiles

### QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** TC20885

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VK578-MB	K13177.D	1	12/06/12	EM	n/a	n/a	VK578

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20885-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.34	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l	
108-88-3	Toluene	ND	1.0	0.33	ug/l	
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	107% 72-122%
17060-07-0	1,2-Dichloroethane-D4	105% 68-124%
2037-26-5	Toluene-D8	107% 80-119%
460-00-4	4-Bromofluorobenzene	103% 72-126%

## Blank Spike Summary

Page 1 of 1

**Job Number:** TC20885

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VK578-BS	K13175.D	1	12/06/12	EM	n/a	n/a	VK578

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20885-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	23.5	94	68-119
100-41-4	Ethylbenzene	25	23.4	94	71-117
108-88-3	Toluene	25	23.0	92	73-119
1330-20-7	Xylene (total)	75	71.7	96	74-119

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	103%	68-124%
2037-26-5	Toluene-D8	105%	80-119%
460-00-4	4-Bromofluorobenzene	101%	72-126%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** TC20885

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20506-1MS	K13179.D	1	12/06/12	EM	n/a	n/a	VK578
TC20506-1MSD	K13180.D	1	12/06/12	EM	n/a	n/a	VK578
TC20506-1	K13178.D	1	12/06/12	EM	n/a	n/a	VK578

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20885-1

CAS No.	Compound	TC20506-1 ug/l	Spike Q ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	25	23.4	94	23.1	92	1	68-119/12
100-41-4	Ethylbenzene	ND	25	22.9	92	22.6	90	1	71-117/12
108-88-3	Toluene	ND	25	23.0	92	22.1	88	4	73-119/13
1330-20-7	Xylene (total)	ND	75	71.6	95	69.3	92	3	74-119/13

CAS No.	Surrogate Recoveries	MS	MSD	TC20506-1	Limits
1868-53-7	Dibromofluoromethane	108%	108%	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	103%	105%	104%	68-124%
2037-26-5	Toluene-D8	107%	105%	106%	80-119%
460-00-4	4-Bromofluorobenzene	103%	104%	104%	72-126%

\* = Outside of Control Limits.

## GC Volatiles

## QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** TC20885

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS233-MB	SS005056.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20885-1

CAS No.	Compound	Result	RL	MDL	Units	Q
74-85-1	Ethene	ND	1.0	0.50	ug/l	
74-84-0	Ethane	ND	1.0	0.50	ug/l	
74-98-6	Propane	ND	1.5	0.75	ug/l	
75-28-5	Isobutane	ND	1.5	0.75	ug/l	
106-97-8	Butane	ND	1.5	0.75	ug/l	

Method Blank Summary

Job Number: TC20885  
Account: PESTXST EarthCon Consultants  
Project: Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS234-MB	SS005099.D	1	12/10/12	LT	n/a	n/a	GSS234

The QC reported here applies to the following samples: Method: RSKSOP-147/175

TC20885-1

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	ND	0.50	0.30	ug/l	

## Blank Spike Summary

Page 1 of 1

**Job Number:** TC20885

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS233-BS	SS005054.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20885-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-85-1	Ethene	57.4	43.2	75	52-145
74-84-0	Ethane	43.3	47.1	109	68-131
74-98-6	Propane	60.6	60.5	100	69-131
75-28-5	Isobutane	72.5	70.4	97	72-131
106-97-8	Butane	76.6	73.6	96	66-128

\* = Outside of Control Limits.



Blank Spike Summary

Job Number: TC20885  
Account: PESTXST EarthCon Consultants  
Project: Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS234-BS	SS005096.D	1	12/10/12	LT	n/a	n/a	GSS234

The QC reported here applies to the following samples: Method: RSKSOP-147/175

TC20885-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	21.5	20.9	97	68-139

\* = Outside of Control Limits.

## Matrix Spike Summary

Page 1 of 1

**Job Number:** TC20885

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20970-2MS <sup>a</sup>	SS005067.D	1	12/07/12	LT	n/a	n/a	GSS233
TC20970-2 <sup>a</sup>	SS005066.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20885-1

CAS No.	Compound	TC20970-2 ug/l	Spike Q ug/l	MS ug/l	MS %	Limits
74-85-1	Ethene	ND	57.4	46.6	81	52-145
74-84-0	Ethane	4.71	43.3	46.7	97	68-131
74-98-6	Propane	ND	60.6	53.4	88	69-131
75-28-5	Isobutane	ND	72.5	61.8	85	72-131
106-97-8	Butane	ND	76.6	66.0	86	66-128

(a) Sample was not preserved to a pH < 2.

\* = Outside of Control Limits.

## Matrix Spike Summary

Page 1 of 1

**Job Number:** TC20885

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC21021-2MS	SS005113.D	1	12/10/12	LT	n/a	n/a	GSS234
TC21021-2	SS005112.D	1	12/10/12	LT	n/a	n/a	GSS234

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20885-1

CAS No.	Compound	TC21021-2 ug/l	Spike Q ug/l	MS ug/l	MS %	Limits
74-82-8	Methane	1.49	21.5	24.3	106	68-139

\* = Outside of Control Limits.

## Duplicate Summary

Page 1 of 1

**Job Number:** TC20885

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20879-1DUP	SS005062.D	1	12/07/12	LT	n/a	n/a	GSS233
TC20879-1	SS005061.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20885-1

CAS No.	Compound	TC20879-1	DUP	Q	RPD	Limits
		ug/l	Q ug/l			
74-85-1	Ethene	1.0 U	ND		nc	27
74-84-0	Ethane	1.0 U	ND		nc	43
74-98-6	Propane	1.5 U	ND		nc	21
75-28-5	Isobutane	1.5 U	ND		nc	35
106-97-8	Butane	1.5 U	ND		nc	33

\* = Outside of Control Limits.

## Duplicate Summary

Page 1 of 1

**Job Number:** TC20885

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC21021-1DUP	SS005111.D	1	12/10/12	LT	n/a	n/a	GSS234
TC21021-1	SS005110.D	1	12/10/12	LT	n/a	n/a	GSS234

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20885-1

CAS No.	Compound	TC21021-1		DUP		Q	RPD	Limits
		ug/l	Q	ug/l	Q			
74-82-8	Methane	0.88		0.86			2	53

\* = Outside of Control Limits.



12/12/12

## Technical Report for

EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW6-Tho

Accutest Job Number: TC20878

Sampling Date: 12/01/12


Report to:

EarthCon Consultants  
4800 Sugar Grove Suite 420  
Stafford, TX 77477  
gfloreslovo@earthcon.com; djackson@jacksonsjoberg.com;  
mcpatton@rangeresources.com; escott@earthcon.com  
ATTN: Gabriela Floreslovo

Total number of pages in report: **26**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

  
Richard Rodriguez  
Laboratory Director

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366)  
LA (85695/04004) OK (211-035)

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Test results relate only to samples analyzed.

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Sample Summary

EarthCon Consultants

Job No: TC20878

Quarterly Well Sampling, Parker County, Texas  
Project No: 3rd Quarter / WW6-Tho

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
TC20878-1	12/01/12	15:15	12/04/12	AQ	Ground Water	WW6-THO-120112



## SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** EarthCon Consultants

**Job No** TC20878

**Site:** Quarterly Well Sampling, Parker County, Texas

**Report Date** 12/12/2012 10:34:08 A

1 Sample was collected on 12/01/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20878. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### Volatiles by GCMS By Method SW846 8260B

**Matrix** AQ

**Batch ID:** VX1673

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20864-1MS, TC20864-1MSD were used as the QC samples indicated.

### Volatiles by GC By Method RSKSOP-147/175

**Matrix** AQ

**Batch ID:** GSS233

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20879-1DUP, TC20970-2MS were used as the QC samples indicated.
- Matrix Spike Recovery for Methane is outside control limits. Outside control limits due to high level in sample relative to spike amount.
- TC20970-2MS: Sample was not preserved to a pH < 2.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used

Summary of Hits

**Job Number:** TC20878  
**Account:** EarthCon Consultants  
**Project:** Quarterly Well Sampling, Parker County, Texas  
**Collected:** 12/01/12



Lab Sample ID	Client Sample ID	Result/ Analyte	Qual	MQL	SDL	Units	Method
TC20878-1	WW6-THO-120112						
		Methane	0.577	0.0050	0.0030	mg/l	RSKSOP-147/175
		Ethane	0.0350	0.0010	0.00050	mg/l	RSKSOP-147/175

Sample Results

Report of Analysis

## Report of Analysis

<b>Client Sample ID:</b>	WW6-THO-120112	<b>Date Sampled:</b>	12/01/12
<b>Lab Sample ID:</b>	TC20878-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	X0087075.D	1	12/06/12	CF	n/a	n/a	VX1673
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

## Purgeable Aromatics

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2	Benzene	0.00034 U	0.0010	0.00034	mg/l	
108-88-3	Toluene	0.00033 U	0.0010	0.00033	mg/l	
100-41-4	Ethylbenzene	0.00032 U	0.0010	0.00032	mg/l	
1330-20-7	Xylene (total)	0.00087 U	0.0030	0.00087	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%		72-122%
17060-07-0	1,2-Dichloroethane-D4	97%		68-124%
2037-26-5	Toluene-D8	98%		80-119%
460-00-4	4-Bromofluorobenzene	99%		72-126%

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	WW6-THO-120112	<b>Date Sampled:</b>	12/01/12
<b>Lab Sample ID:</b>	TC20878-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	RSKSOP-147/175		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	SS005059.D	1	12/07/12	LT	n/a	n/a	GSS233
Run #2	SS005060.D	10	12/07/12	LT	n/a	n/a	GSS233

## RSK147 Special List

CAS No.	Compound	Result	MQL	SDL	Units	Q
74-82-8	Methane	0.577 <sup>a</sup>	0.0050	0.0030	mg/l	
74-85-1	Ethene	0.00050 U	0.0010	0.00050	mg/l	
74-84-0	Ethane	0.0350	0.0010	0.00050	mg/l	
74-98-6	Propane	0.00075 U	0.0015	0.00075	mg/l	
75-28-5	Isobutane	0.00075 U	0.0015	0.00075	mg/l	
106-97-8	Butane	0.00075 U	0.0015	0.00075	mg/l	

(a) Result is from Run# 2

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Misc. Forms

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### Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody
- LRC Form



**Accutest Job Number:** TC20878      **Client:** EARTHCON CONSULTANTS      **Project:** 3RD QTR WELL SAMPLING, PARKER COUNTY, T  
**Date / Time Received:** 12/4/2012      **Delivery Method:** Client      **Airbill #s:** \_\_\_\_\_  
**No. Coolers:** 1      **Therm ID:** IR6      **Temp Adjustment Factor:** 0.2  
**Cooler Temps (Initial/Adjusted):** #1: (2.2/2.4)

<b>Cooler Security</b>		<b>Y or N</b>		<b>Y or N</b>	
1. Custody Seals Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Cooler Temperature</b>		<b>Y or N</b>			
1. Temp criteria achieved:	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
2. Cooler temp verification:	Infrared Gun				
3. Cooler media:	Ice (bag)				
<b>Quality Control Preservation</b>		<b>Y or N</b>	<b>N/A</b>	<b>WTB</b>	<b>STB</b>
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Trip Blank listed on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
3. Samples preserved properly:	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
4. VOCs headspace free:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		

<b>Sample Integrity - Documentation</b>		<b>Y or N</b>	
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Container labeling complete:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>Sample Integrity - Condition</b>		<b>Y or N</b>	
1. Sample recvd within HT:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. All containers accounted for:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Condition of sample:	Intact		
<b>Sample Integrity - Instructions</b>		<b>Y or N</b>	<b>N/A</b>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments - Received trip blank not listed on COC.  
 - Received one of six vials with headspace bigger than pea size.

**TC20878: Chain of Custody**  
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**Accutest Job Number:** TC20878**CSR:** Elessa Sommers**Response Date:** 12/5/2012

**Response:** Trip blank is on separate report. Sufficient number of vials without headspace are available for the analyses requested.

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## Sample Receipt Log

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**Job #:** TC20878

**Date / Time Received:** 12/4/2012 9:22:00 AM

**Initials:** CH

**Client:** EARTHCON CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	pH	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20878-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20878-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20878-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20878-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20878-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20878-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4

 5.1  
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**TC20878: Chain of Custody**
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# Appendix A Laboratory Data Package Cover Page

TC20878 This data package consists of

- ☐ This signature page, the laboratory review checklist, and the following reportable data:
- ☐ R1 Field chain-of-custody documentation;
- ☐ R2 Sample identification cross-reference;
- ☐ R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - a) Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
  - b) dilution factors,
  - c) preparation methods,
  - d) cleanup methods, and
  - e) if required for the project, tentatively identified compounds (TICs).
- ☐ R4 Surrogate recovery data including:
  - a) Calculated recovery (%R), and
  - b) The laboratory's surrogate QC limits.
- ☐ R5 Test reports/summary forms for blank samples;
- ☐ R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - a) LCS spiking amounts,
  - b) Calculated %R for each analyte, and
  - c) The laboratory's LCS QC limits.
- ☐ R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - a) Samples associated with the MS/MSD clearly identified,
  - b) MS/MSD spiking amounts,
  - c) Concentration of each MS/MSD analyte measured in the parent and
  - d) Calculated %Rs and relative percent differences (RPDs), and
  - e) The laboratory's MS/MSD QC limits
- ☐ R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - a) The amount of analyte measured in the duplicate,
  - b) The calculated RPD, and
  - c) The laboratory's QC limits for analytical duplicates.
- ☐ R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each
- ☐ R10 Other problems or anomalies.


The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

**Release Statement:** I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Report. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld.

**Check, if applicable:** This laboratory meets an exception under 30 TAC&25.6 and was last inspection by

[ ] [X] TCEQ or [ ] \_\_\_\_\_ on April 2011. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

## QA Manager

Name (Printed)	Signature	Official Title (printed)	Date
Richard Rodriguez		Laboratory Director	12/12/2012
_____	_____	_____	_____

LABORATORY REVIEW CHECKLIST: REPORTABLE DATA									
Laboratory Name:		Accutest Gulf Coast		LRC Date:		12/12/2012			
Project Name:		Quarterly Well Sampling, Parker County, Texas		Laboratory Project Number:		TC20878			
Reviewer Name:		Anita Patel		Prep Batch Number(s):		GSS233, VX1673			
# <sup>1</sup>	A <sup>2</sup>	DESCRIPTION				YES	NO	NA <sup>3</sup>	NR <sup>4</sup> ER # <sup>5</sup>
R1	OI	<b>CHAIN-OF-CUSTODY (C-O-C):</b>							
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?				X			
		Were all departures from standard conditions described in an exception report?				X			
R2	OI	<b>Sample and quality control (QC) identification</b>							
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?				X			
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?				X			
R3	OI	<b>Test reports</b>							
		Were samples prepared and analyzed within holding times?				X			
		Other than those results <MQL, were all other raw values bracketed by calibration standards?				X			
		Were calculations checked by a peer or supervisor?				X			
		Were all analyte identifications checked by a peer or supervisor?				X			
		Were sample detection limits reported for all analytes not detected?				X			
		Were all results for soil and sediment samples reported on a dry weight basis?						X	
		Were % moisture (or solids) reported for all soil and sediment samples?						X	
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?						X	
		If required for the project, are TIC's reported?						X	
R4	O	<b>Surrogate recovery data</b>							
		Were surrogates added prior to extraction?				X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?				X			
R5	OI	<b>Test reports/summary forms for blank samples</b>							
		Were appropriate type(s) of blanks analyzed?				X			
		Were blanks analyzed at the appropriate frequency?				X			
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?				X			
		Were blank concentrations <MQL?				X			
R6	OI	<b>Laboratory control samples (LCS):</b>							
		Were all COCs included in the LCS?				X			
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?				X			
		Were LCSs analyzed at required frequency?				X			
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?				X			
		Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?				X			5
		Was the LCSD RPD within QC limits?						X	
R7	OI	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>							
		Were the project/method specified analytes included in the MS and MSD?				X			
		Were MS/MSD analyzed at the appropriate frequency?				X			
		Were MS (and MSD, if applicable) %Rs within the laboratory QC Limits?					X		4
		Were the MS/MSD RPDs within laboratory QC limits?				X			
R8	OI	<b>Analytical duplicate data</b>							
		Were appropriate analytical duplicates analyzed for each matrix?				X			
		Were analytical duplicates analyzed at the appropriate frequency?				X			
		Were RPDs or relative standard deviations within the laboratory QC limits?				X			
R9	OI	<b>Method quantitation limits (MQLs):</b>							
		Are the MQLs for each method analyte included in the laboratory data package?				X			
		Do the MQLs correspond to the concentration of the lowest non-zero calibration				X			
		Are unadjusted MQLs and DCs included in the laboratory data package?					X		2
R10	OI	<b>Other problems/anomalies</b>							
		Are all known problems/anomalies/special conditions noted in this LRC and ER?				X			
		Was applicable and available technology used to lower the SDL to minimize the				X			
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package?				X			3

Laboratory Name:		Accutest Gulf Coast	LRC Date:		12/12/2012	
Project Name:		Quarterly Well Sampling, Parker	Laboratory Project Number:		TC20878	
Reviewer Name:		Anita Patel	Prep Batch Number(s):		GSS233, VX1673	
# <sup>1</sup>	A <sup>2</sup>	DESCRIPTION	YES	NO	NA <sup>3</sup>	NR <sup>4</sup> ER # <sup>5</sup>
S1	OI	<b>Initial calibration (ICAL)</b>				
		Were response factors and/or relative response factors for each analyte within QC limits?	X			
		Were percent RSDs or correlation coefficient criteria met?	X			
		Was the number of standards recommended in the method used for all analytes?	X			
		Were all points generated between the lowest and highest standard used to calculate the curve?	X			
		Are ICAL data available for all instruments used?	X			
		Has the initial calibration curve been verified using an appropriate second source standard?	X			
S2	OI	<b>Initial and continuing calibration verification (ICCV AND CCV) and continuing</b>				
		Was the CCV analyzed at the method-required frequency?	X			
		Were percent differences for each analyte within the method-required QC limits?	X			
		Was the ICAL curve verified for each analyte?	X			
		Was the absolute value of the analyte concentration in the inorganic CCB<MDL?			X	
S3	O	<b>Mass spectral tuning</b>				
		Was the appropriate compound for the method used for tuning?	X			
		Were ion abundance data within the method-required QC limits?	X			
S4	O	<b>Internal standards (IS)</b>				
		Were IS area counts and retention times within the method-required QC limits?	X			
S5	OI	<b>Raw data (NELAC Section 5.5.10)</b>				
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X			
		Were data associated with manual integrations flagged on the raw data?	X			
S6	O	<b>Dual column confirmation</b>				
		Did dual column confirmation results meet the method-required QC?			X	
S7	O	<b>Tentatively identified compounds (TICs):</b>				
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X	
S8	I	<b>Interference Check Sample (ICS) results</b>				
		Were percent recoveries within method QC limits?			X	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>				
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X	
S10	OI	<b>Method detection limit (MDL) studies</b>				
		Was a MDL study performed for each reported analyte?	X			
		Is the MDL either adjusted or supported by the analysis of DCSs?	X			5
S11	OI	<b>Proficiency test reports</b>				
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X			
S12	OI	<b>Standards documentation</b>				
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate source?	X			
S13	OI	<b>Compound/analyte identification procedures</b>				
		Are the procedures for compound/analyte identification documented?	X			
S14	OI	<b>Demonstration of analyst competency (DOC)</b>				
		Was DOC conducted consistent with NELAC Chapter 5?	X			
		Is documentation of the analyst's competency up-to-date and on file?	X			
S15	OI	<b>Verification/validation documentation for methods (NELAC Chapter 5)</b>				
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X			
S16	OI	<b>Laboratory standard operating procedures (SOPs)</b>				
		Are laboratory SOPs current and on file for each method performed?	X			

LABORATORY REVIEW CHECKLIST (continued): Exception Reports			
Laboratory Name:	Accutest Gulf Coast	LRC Date:	12/12/2012
Project Name:	Quarterly Well Sampling, Parker	Laboratory Project Number:	TC20878
Reviewer Name:	Anita Patel	Prep Batch Number(s):	GSS233, VX1673
ER# <sup>1</sup>	Description		
1	For reporting purposes, the MQL is defined in the report as the RL. The unadjusted MQL/RL is reported in the method blank. The SDL is defined in the report as the MDL.		
2	For reporting purposes, the method blank represents the unadjusted MQL. The DCS is on file in the laboratory and is not included in the laboratory data package.		
3	The laboratory is NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package for analytes that are listed in the Texas Fields of Accreditation.		
4	All anomalies are discussed in the case narrative.		
5	The laboratory does not perform DCS analysis for Method RSKSOP-147/175. The components reported are not listed or do not have values in the Texas TRRP PCL tables.		

1ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on

## GC/MS Volatiles

### QC Data Summaries

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Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** TC20878

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VX1673-MB	X0087062.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20878-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.34	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l	
108-88-3	Toluene	ND	1.0	0.33	ug/l	
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	105% 72-122%
17060-07-0	1,2-Dichloroethane-D4	95% 68-124%
2037-26-5	Toluene-D8	99% 80-119%
460-00-4	4-Bromofluorobenzene	98% 72-126%



## Blank Spike Summary

Page 1 of 1

**Job Number:** TC20878

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VX1673-BS	X0087060.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20878-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	22.2	89	68-119
100-41-4	Ethylbenzene	25	22.1	88	71-117
108-88-3	Toluene	25	22.4	90	73-119
1330-20-7	Xylene (total)	75	67.7	90	74-119

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	101%	72-122%
17060-07-0	1,2-Dichloroethane-D4	99%	68-124%
2037-26-5	Toluene-D8	101%	80-119%
460-00-4	4-Bromofluorobenzene	92%	72-126%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** TC20878

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20864-1MS	X0087064.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1MSD	X0087065.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1	X0087063.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20878-1

CAS No.	Compound	TC20864-1		Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
		ug/l	Q							
71-43-2	Benzene	1.0 U		25	23.0	92	22.4	90	3	68-119/12
100-41-4	Ethylbenzene	1.0 U		25	22.7	91	22.4	90	1	71-117/12
108-88-3	Toluene	1.0 U		25	22.9	92	22.5	90	2	73-119/13
1330-20-7	Xylene (total)	3.0 U		75	69.8	93	68.4	91	2	74-119/13

CAS No.	Surrogate Recoveries	MS	MSD	TC20864-1	Limits
1868-53-7	Dibromofluoromethane	103%	101%	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	98%	98%	96%	68-124%
2037-26-5	Toluene-D8	100%	100%	100%	80-119%
460-00-4	4-Bromofluorobenzene	91%	92%	98%	72-126%

\* = Outside of Control Limits.

## GC Volatiles

## QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** TC20878

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS233-MB	SS005056.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20878-1

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	ND	0.50	0.30	ug/l	
74-85-1	Ethene	ND	1.0	0.50	ug/l	
74-84-0	Ethane	ND	1.0	0.50	ug/l	
74-98-6	Propane	ND	1.5	0.75	ug/l	
75-28-5	Isobutane	ND	1.5	0.75	ug/l	
106-97-8	Butane	ND	1.5	0.75	ug/l	

## Blank Spike Summary

Page 1 of 1

**Job Number:** TC20878

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS233-BS	SS005054.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20878-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	21.5	16.2	75	68-139
74-85-1	Ethene	57.4	43.2	75	52-145
74-84-0	Ethane	43.3	47.1	109	68-131
74-98-6	Propane	60.6	60.5	100	69-131
75-28-5	Isobutane	72.5	70.4	97	72-131
106-97-8	Butane	76.6	73.6	96	66-128

\* = Outside of Control Limits.

## Matrix Spike Summary

Page 1 of 1

**Job Number:** TC20878

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20970-2MS <sup>a</sup>	SS005067.D	1	12/07/12	LT	n/a	n/a	GSS233
TC20970-2 <sup>a</sup>	SS005066.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20878-1

CAS No.	Compound	TC20970-2 ug/l	Spike Q ug/l	MS ug/l	MS %	Limits
74-82-8	Methane	105	21.5	95.8	-42* <sup>b</sup>	68-139
74-85-1	Ethene	ND	57.4	46.6	81	52-145
74-84-0	Ethane	4.71	43.3	46.7	97	68-131
74-98-6	Propane	ND	60.6	53.4	88	69-131
75-28-5	Isobutane	ND	72.5	61.8	85	72-131
106-97-8	Butane	ND	76.6	66.0	86	66-128

(a) Sample was not preserved to a pH < 2.

(b) Outside control limits due to high level in sample relative to spike amount.

\* = Outside of Control Limits.

## Duplicate Summary

Page 1 of 1

**Job Number:** TC20878

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20879-1DUP	SS005062.D	1	12/07/12	LT	n/a	n/a	GSS233
TC20879-1	SS005061.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20878-1

CAS No.	Compound	TC20879-1		Q	RPD	Limits
		ug/l	DUP ug/l			
74-82-8	Methane	4.10	3.34		20	53
74-85-1	Ethene	1.0 U	ND		nc	27
74-84-0	Ethane	1.0 U	ND		nc	43
74-98-6	Propane	1.5 U	ND		nc	21
75-28-5	Isobutane	1.5 U	ND		nc	35
106-97-8	Butane	1.5 U	ND		nc	33

\* = Outside of Control Limits.

Lab #: 321086 Job #: 20030  
 Sample Name/Number: WW6-Tho-120112  
 Company: Oil Tracers, LLC  
 Date Sampled: 12/01/2012  
 Container: Dissolved Gas Bottle  
 Field/Site Name: Third Quarter Well Sampling  
 Location: Parker County, Texas  
 Formation/Depth:  
 Sampling Point:  
 Date Received: 12/05/2012 Date Reported: 2/01/2013

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{18}\text{O}$ ‰
Carbon Monoxide -----	nd			
Hydrogen Sulfide -----	na			
Helium -----	na			
Hydrogen -----	nd			
Argon -----	1.64			
Oxygen -----	0.16			
Nitrogen -----	87.87			
Carbon Dioxide -----	0.28			
Methane -----	9.94	-41.82	-124.0	
Ethane -----	0.106	-16.3		
Ethylene -----	nd			
Propane -----	nd			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	0.0009			
Iso-pentane -----	nd			
N-pentane -----	nd			
Hexanes + -----	nd			

**Remarks:**

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.76

\*Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

\*\* Ethane isotopes and dD isotopes of methane were obtained online via GC-C/P-IRMS

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.





12/12/12

## Technical Report for

EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW21-Van

Accutest Job Number: TC20879

Sampling Date: 11/30/12


Report to:

EarthCon Consultants  
4800 Sugar Grove Suite 420  
Stafford, TX 77477  
gfloreslovo@earthcon.com; djackson@jacksonsjoberg.com;  
mcpatton@rangeresources.com; escott@earthcon.com  
ATTN: Gabriela Floreslovo

Total number of pages in report: **26**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

  
Richard Rodriguez  
Laboratory Director

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366)  
LA (85695/04004) OK (211-035)

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Test results relate only to samples analyzed.

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Sample Summary

EarthCon Consultants

Job No: TC20879

Quarterly Well Sampling, Parker County, Texas  
Project No: 3rd Quarter / WW21-Van

Sample Number	Collected		Matrix			Client Sample ID
	Date	Time By	Received	Code	Type	
TC20879-1	11/30/12	17:10	12/04/12	AQ	Ground Water	WW21-VAN-113012

## SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** EarthCon Consultants

**Job No** TC20879

**Site:** Quarterly Well Sampling, Parker County, Texas

**Report Date** 12/12/2012 10:36:59 A

1 Sample was collected on 11/30/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20879. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### Volatiles by GCMS By Method SW846 8260B

**Matrix** AQ

**Batch ID:** VX1673

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20864-1MS, TC20864-1MSD were used as the QC samples indicated.

### Volatiles by GC By Method RSKSOP-147/175

**Matrix** AQ

**Batch ID:** GSS233

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20879-1DUP, TC20970-2MS were used as the QC samples indicated.
- Matrix Spike Recovery for Methane is outside control limits. Outside control limits due to high level in sample relative to spike amount.
- TC20970-2MS: Sample was not preserved to a pH < 2.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used

Summary of Hits

**Job Number:** TC20879  
**Account:** EarthCon Consultants  
**Project:** Quarterly Well Sampling, Parker County, Texas  
**Collected:** 11/30/12



Lab Sample ID	Client Sample ID	Result/ Analyte	Qual	MQL	SDL	Units	Method
---------------	------------------	--------------------	------	-----	-----	-------	--------

TC20879-1	WW21-VAN-113012						
Methane		0.00410		0.00050	0.00030	mg/l	RSKSOP-147/175

Sample Results

Report of Analysis

## Report of Analysis

<b>Client Sample ID:</b>	WW21-VAN-113012	<b>Date Sampled:</b>	11/30/12
<b>Lab Sample ID:</b>	TC20879-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	X0087076.D	1	12/06/12	CF	n/a	n/a	VX1673
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

## Purgeable Aromatics

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2	Benzene	0.00034 U	0.0010	0.00034	mg/l	
108-88-3	Toluene	0.00033 U	0.0010	0.00033	mg/l	
100-41-4	Ethylbenzene	0.00032 U	0.0010	0.00032	mg/l	
1330-20-7	Xylene (total)	0.00087 U	0.0030	0.00087	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%		72-122%
17060-07-0	1,2-Dichloroethane-D4	96%		68-124%
2037-26-5	Toluene-D8	98%		80-119%
460-00-4	4-Bromofluorobenzene	98%		72-126%

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	WW21-VAN-113012	<b>Date Sampled:</b>	11/30/12
<b>Lab Sample ID:</b>	TC20879-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	RSKSOP-147/175		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	SS005061.D	1	12/07/12	LT	n/a	n/a	GSS233
Run #2							

## RSK147 Special List

CAS No.	Compound	Result	MQL	SDL	Units	Q
74-82-8	Methane	0.00410	0.00050	0.00030	mg/l	
74-85-1	Ethene	0.00050 U	0.0010	0.00050	mg/l	
74-84-0	Ethane	0.00050 U	0.0010	0.00050	mg/l	
74-98-6	Propane	0.00075 U	0.0015	0.00075	mg/l	
75-28-5	Isobutane	0.00075 U	0.0015	0.00075	mg/l	
106-97-8	Butane	0.00075 U	0.0015	0.00075	mg/l	

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound



## Misc. Forms

5

### Custody Documents and Other Forms

---

Includes the following where applicable:

- Chain of Custody
- LRC Form

10165 Harwin Dr, Ste 150 Houston, TX 77036  
TEL: 713-271-4700 FAX: 713-271-4770  
[www.accutest.com](http://www.accutest.com)

[illegible]

## TC20879: Chain of Custody

Page 1 of 4

**Accutest Job Number:** TC20879      **Client:** EARTHCON CONSULTANTS      **Project:** 3RD QTR WELL SAMPLING,PARKER COUNTY,T  
**Date / Time Received:** 12/4/2012      **Delivery Method:** Client      **Airbill #s:** \_\_\_\_\_  
**No. Coolers:** 1      **Therm ID:** IR6      **Temp Adjustment Factor:** 0.2  
**Cooler Temps (Initial/Adjusted):** #1: (2.2/2.4)

<b>Cooler Security</b>		<b>Y or N</b>		<b>Y or N</b>	
1. Custody Seals Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Cooler Temperature</b>		<b>Y or N</b>			
1. Temp criteria achieved:	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
2. Cooler temp verification:	Infrared Gun				
3. Cooler media:	Ice (bag)				
<b>Quality Control Preservation</b>	<b>Y</b>	<b>or N</b>	<b>N/A</b>	<b>WTB</b>	<b>STB</b>
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Trip Blank listed on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
3. Samples preserved properly:	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
4. VOCs headspace free:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

<b>Sample Integrity - Documentation</b>	<b>Y</b>	<b>or N</b>	
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Container labeling complete:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>Sample Integrity - Condition</b>	<b>Y</b>	<b>or N</b>	
1. Sample recvd within HT:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. All containers accounted for:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Condition of sample:	Intact		
<b>Sample Integrity - Instructions</b>	<b>Y</b>	<b>or N</b>	<b>N/A</b>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments - Received trip blank not listed on COC.  
 - Received six vials, COC lists three.

**Accutest Job Number:** TC20879

**CSR:** Elessa Sommers

**Response Date:** 12/5/2012

**Response:** Trip blank is on separate report.

5.1

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**TC20879: Chain of Custody**  
**Page 3 of 4**

# Sample Receipt Log

**Job #:** TC20879

**Date / Time Received:** 12/4/2012 9:22:00 AM

**Initials:** CH

**Client:** EARTHCON CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	pH	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20879-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20879-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20879-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20879-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20879-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20879-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4

5.1  
5

**TC20879: Chain of Custody**

**Page 4 of 4**

# Appendix A Laboratory Data Package Cover Page

TC20879 This data package consists of

- ☐ This signature page, the laboratory review checklist, and the following reportable data:
- ☐ R1 Field chain-of-custody documentation;
- ☐ R2 Sample identification cross-reference;
- ☐ R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - a) Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
  - b) dilution factors,
  - c) preparation methods,
  - d) cleanup methods, and
  - e) if required for the project, tentatively identified compounds (TICs).
- ☐ R4 Surrogate recovery data including:
  - a) Calculated recovery (%R), and
  - b) The laboratory's surrogate QC limits.
- ☐ R5 Test reports/summary forms for blank samples;
- ☐ R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - a) LCS spiking amounts,
  - b) Calculated %R for each analyte, and
  - c) The laboratory's LCS QC limits.
- ☐ R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - a) Samples associated with the MS/MSD clearly identified,
  - b) MS/MSD spiking amounts,
  - c) Concentration of each MS/MSD analyte measured in the parent and
  - d) Calculated %Rs and relative percent differences (RPDs), and
  - e) The laboratory's MS/MSD QC limits
- ☐ R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - a) The amount of analyte measured in the duplicate,
  - b) The calculated RPD, and
  - c) The laboratory's QC limits for analytical duplicates.
- ☐ R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each
- ☐ R10 Other problems or anomalies.


The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

**Release Statement:** I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Report. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld.

**Check, if applicable:** This laboratory meets an exception under 30 TAC&25.6 and was last inspection by

[ ] [X] TCEQ or [ ] \_\_\_\_\_ on April 2011. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

## QA Manager

Name (Printed)	Signature	Official Title (printed)	Date
Richard Rodriguez		Laboratory Director	12/12/2012
_____	_____	_____	_____

LABORATORY REVIEW CHECKLIST: REPORTABLE DATA									
Laboratory Name:		Accutest Gulf Coast Quarterly Well Sampling, Parker County, Texas		LRC Date:		12/12/2012			
Project Name:				Laboratory Project Number:		TC20879			
Reviewer Name:		Anita Patel		Prep Batch Number(s):		GSS233, VX1673			
# <sup>1</sup>	A <sup>2</sup>	DESCRIPTION				YES	NO	NA <sup>3</sup>	NR <sup>4</sup> ER # <sup>5</sup>
R1	OI	<b>CHAIN-OF-CUSTODY (C-O-C):</b>							
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?				X			
		Were all departures from standard conditions described in an exception report?				X			
R2	OI	<b>Sample and quality control (QC) identification</b>							
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?				X			
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?				X			
R3	OI	<b>Test reports</b>							
		Were samples prepared and analyzed within holding times?				X			
		Other than those results <MQL, were all other raw values bracketed by calibration standards?				X			
		Were calculations checked by a peer or supervisor?				X			
		Were all analyte identifications checked by a peer or supervisor?				X			
		Were sample detection limits reported for all analytes not detected?				X			
		Were all results for soil and sediment samples reported on a dry weight basis?						X	
		Were % moisture (or solids) reported for all soil and sediment samples?						X	
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?						X	
		If required for the project, are TIC's reported?						X	
R4	O	<b>Surrogate recovery data</b>							
		Were surrogates added prior to extraction?				X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?				X			
R5	OI	<b>Test reports/summary forms for blank samples</b>							
		Were appropriate type(s) of blanks analyzed?				X			
		Were blanks analyzed at the appropriate frequency?				X			
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?				X			
		Were blank concentrations <MQL?				X			
R6	OI	<b>Laboratory control samples (LCS):</b>							
		Were all COCs included in the LCS?				X			
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?				X			
		Were LCSs analyzed at required frequency?				X			
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?				X			
		Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?				X			5
		Was the LCSD RPD within QC limits?						X	
R7	OI	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>							
		Were the project/method specified analytes included in the MS and MSD?				X			
		Were MS/MSD analyzed at the appropriate frequency?				X			
		Were MS (and MSD, if applicable) %Rs within the laboratory QC Limits?					X		4
		Were the MS/MSD RPDs within laboratory QC limits?				X			
R8	OI	<b>Analytical duplicate data</b>							
		Were appropriate analytical duplicates analyzed for each matrix?				X			
		Were analytical duplicates analyzed at the appropriate frequency?				X			
		Were RPDs or relative standard deviations within the laboratory QC limits?				X			
R9	OI	<b>Method quantitation limits (MQLs):</b>							
		Are the MQLs for each method analyte included in the laboratory data package?				X			
		Do the MQLs correspond to the concentration of the lowest non-zero calibration				X			
		Are unadjusted MQLs and DCs included in the laboratory data package?					X		2
R10	OI	<b>Other problems/anomalies</b>							
		Are all known problems/anomalies/special conditions noted in this LRC and ER?				X			
		Was applicable and available technology used to lower the SDL to minimize the				X			
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package?				X			3

Laboratory Name:		Accutest Gulf Coast	LRC Date:		12/12/2012	
Project Name:		Quarterly Well Sampling, Parker	Laboratory Project Number:		TC20879	
Reviewer Name:		Anita Patel	Prep Batch Number(s):		GSS233, VX1673	
# <sup>1</sup>	A <sup>2</sup>	DESCRIPTION	YES	NO	NA <sup>3</sup>	NR <sup>4</sup> ER # <sup>5</sup>
S1	OI	<b>Initial calibration (ICAL)</b>				
		Were response factors and/or relative response factors for each analyte within QC limits?	X			
		Were percent RSDs or correlation coefficient criteria met?	X			
		Was the number of standards recommended in the method used for all analytes?	X			
		Were all points generated between the lowest and highest standard used to calculate the curve?	X			
		Are ICAL data available for all instruments used?	X			
		Has the initial calibration curve been verified using an appropriate second source standard?	X			
S2	OI	<b>Initial and continuing calibration verification (ICCV AND CCV) and continuing</b>				
		Was the CCV analyzed at the method-required frequency?	X			
		Were percent differences for each analyte within the method-required QC limits?	X			
		Was the ICAL curve verified for each analyte?	X			
		Was the absolute value of the analyte concentration in the inorganic CCB<MDL?			X	
S3	O	<b>Mass spectral tuning</b>				
		Was the appropriate compound for the method used for tuning?	X			
		Were ion abundance data within the method-required QC limits?	X			
S4	O	<b>Internal standards (IS)</b>				
		Were IS area counts and retention times within the method-required QC limits?	X			
S5	OI	<b>Raw data (NELAC Section 5.5.10)</b>				
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X			
		Were data associated with manual integrations flagged on the raw data?	X			
S6	O	<b>Dual column confirmation</b>				
		Did dual column confirmation results meet the method-required QC?			X	
S7	O	<b>Tentatively identified compounds (TICs):</b>				
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X	
S8	I	<b>Interference Check Sample (ICS) results</b>				
		Were percent recoveries within method QC limits?			X	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>				
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X	
S10	OI	<b>Method detection limit (MDL) studies</b>				
		Was a MDL study performed for each reported analyte?	X			
		Is the MDL either adjusted or supported by the analysis of DCSs?	X			5
S11	OI	<b>Proficiency test reports</b>				
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X			
S12	OI	<b>Standards documentation</b>				
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate source?	X			
S13	OI	<b>Compound/analyte identification procedures</b>				
		Are the procedures for compound/analyte identification documented?	X			
S14	OI	<b>Demonstration of analyst competency (DOC)</b>				
		Was DOC conducted consistent with NELAC Chapter 5?	X			
		Is documentation of the analyst's competency up-to-date and on file?	X			
S15	OI	<b>Verification/validation documentation for methods (NELAC Chapter 5)</b>				
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X			
S16	OI	<b>Laboratory standard operating procedures (SOPs)</b>				
		Are laboratory SOPs current and on file for each method performed?	X			



LABORATORY REVIEW CHECKLIST (continued): Exception Reports			
Laboratory Name:	Accutest Gulf Coast	LRC Date:	12/12/2012
Project Name:	Quarterly Well Sampling, Parker	Laboratory Project Number:	TC20879
Reviewer Name:	Anita Patel	Prep Batch Number(s):	GSS233, VX1673
ER# <sup>1</sup>	Description		
1	For reporting purposes, the MQL is defined in the report as the RL. The unadjusted MQL/RL is reported in the method blank. The SDL is defined in the report as the MDL.		
2	For reporting purposes, the method blank represents the unadjusted MQL. The DCS is on file in the laboratory and is not included in the laboratory data package.		
3	The laboratory is NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package for analytes that are listed in the Texas Fields of Accreditation.		
4	All anomalies are discussed in the case narrative.		
5	The laboratory does not perform DCS analysis for Method RSKSOP-147/175. The components reported are not listed or do not have values in the Texas TRRP PCL tables.		

1ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on

## GC/MS Volatiles

### QC Data Summaries

---

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** TC20879

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VX1673-MB	X0087062.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20879-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.34	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l	
108-88-3	Toluene	ND	1.0	0.33	ug/l	
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	105% 72-122%
17060-07-0	1,2-Dichloroethane-D4	95% 68-124%
2037-26-5	Toluene-D8	99% 80-119%
460-00-4	4-Bromofluorobenzene	98% 72-126%

## Blank Spike Summary

Page 1 of 1

**Job Number:** TC20879

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VX1673-BS	X0087060.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20879-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	22.2	89	68-119
100-41-4	Ethylbenzene	25	22.1	88	71-117
108-88-3	Toluene	25	22.4	90	73-119
1330-20-7	Xylene (total)	75	67.7	90	74-119

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	101%	72-122%
17060-07-0	1,2-Dichloroethane-D4	99%	68-124%
2037-26-5	Toluene-D8	101%	80-119%
460-00-4	4-Bromofluorobenzene	92%	72-126%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** TC20879

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20864-1MS	X0087064.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1MSD	X0087065.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1	X0087063.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20879-1

CAS No.	Compound	TC20864-1		Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
		ug/l	Q							
71-43-2	Benzene	1.0 U		25	23.0	92	22.4	90	3	68-119/12
100-41-4	Ethylbenzene	1.0 U		25	22.7	91	22.4	90	1	71-117/12
108-88-3	Toluene	1.0 U		25	22.9	92	22.5	90	2	73-119/13
1330-20-7	Xylene (total)	3.0 U		75	69.8	93	68.4	91	2	74-119/13

CAS No.	Surrogate Recoveries	MS	MSD	TC20864-1	Limits
1868-53-7	Dibromofluoromethane	103%	101%	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	98%	98%	96%	68-124%
2037-26-5	Toluene-D8	100%	100%	100%	80-119%
460-00-4	4-Bromofluorobenzene	91%	92%	98%	72-126%

\* = Outside of Control Limits.

## GC Volatiles

## QC Data Summaries

---

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** TC20879

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS233-MB	SS005056.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20879-1

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	ND	0.50	0.30	ug/l	
74-85-1	Ethene	ND	1.0	0.50	ug/l	
74-84-0	Ethane	ND	1.0	0.50	ug/l	
74-98-6	Propane	ND	1.5	0.75	ug/l	
75-28-5	Isobutane	ND	1.5	0.75	ug/l	
106-97-8	Butane	ND	1.5	0.75	ug/l	

## Blank Spike Summary

Page 1 of 1

**Job Number:** TC20879

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS233-BS	SS005054.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20879-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	21.5	16.2	75	68-139
74-85-1	Ethene	57.4	43.2	75	52-145
74-84-0	Ethane	43.3	47.1	109	68-131
74-98-6	Propane	60.6	60.5	100	69-131
75-28-5	Isobutane	72.5	70.4	97	72-131
106-97-8	Butane	76.6	73.6	96	66-128

\* = Outside of Control Limits.



## Matrix Spike Summary

Page 1 of 1

**Job Number:** TC20879

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20970-2MS <sup>a</sup>	SS005067.D	1	12/07/12	LT	n/a	n/a	GSS233
TC20970-2 <sup>a</sup>	SS005066.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20879-1

CAS No.	Compound	TC20970-2 ug/l	Spike Q ug/l	MS ug/l	MS %	Limits
74-82-8	Methane	105	21.5	95.8	-42* <sup>b</sup>	68-139
74-85-1	Ethene	ND	57.4	46.6	81	52-145
74-84-0	Ethane	4.71	43.3	46.7	97	68-131
74-98-6	Propane	ND	60.6	53.4	88	69-131
75-28-5	Isobutane	ND	72.5	61.8	85	72-131
106-97-8	Butane	ND	76.6	66.0	86	66-128

(a) Sample was not preserved to a pH < 2.

(b) Outside control limits due to high level in sample relative to spike amount.

\* = Outside of Control Limits.

## Duplicate Summary

Page 1 of 1

**Job Number:** TC20879

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20879-1DUP	SS005062.D	1	12/07/12	LT	n/a	n/a	GSS233
TC20879-1	SS005061.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20879-1

CAS No.	Compound	TC20879-1	DUP	Q	RPD	Limits
		ug/l	Q ug/l			
74-82-8	Methane	4.10	3.34		20	53
74-85-1	Ethene	1.0 U	ND		nc	27
74-84-0	Ethane	1.0 U	ND		nc	43
74-98-6	Propane	1.5 U	ND		nc	21
75-28-5	Isobutane	1.5 U	ND		nc	35
106-97-8	Butane	1.5 U	ND		nc	33

\* = Outside of Control Limits.

Lab #: 321081 Job #: 20030  
 Sample Name/Number: WW21-Van-113012  
 Company: Oil Tracers, LLC  
 Date Sampled: 11/30/2012  
 Container: Dissolved Gas Bottle  
 Field/Site Name: Third Quarter Well Sampling  
 Location: Parker County, Texas  
 Formation/Depth:  
 Sampling Point:  
 Date Received: 12/05/2012 Date Reported: 2/01/2013

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{18}\text{O}$ ‰
Carbon Monoxide -----	nd			
Hydrogen Sulfide -----	na			
Helium -----	na			
Hydrogen -----	nd			
Argon -----	1.65			
Oxygen -----	14.28			
Nitrogen -----	82.78			
Carbon Dioxide -----	1.24			
Methane -----	0.0546			
Ethane -----	nd			
Ethylene -----	nd			
Propane -----	nd			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	nd			
Iso-pentane -----	nd			
N-pentane -----	nd			
Hexanes + -----	nd			

**Remarks:**

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.78

\*Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.



12/12/12

## Technical Report for

EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW1-Wel

Accutest Job Number: TC20872

Sampling Date: 11/30/12


Report to:

EarthCon Consultants  
4800 Sugar Grove Suite 420  
Stafford, TX 77477  
gfloreslovo@earthcon.com; djackson@jacksonsjoberg.com;  
mcpatton@rangeresources.com; escott@earthcon.com  
ATTN: Gabriela Floreslovo

Total number of pages in report: **26**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

  
Richard Rodriguez  
Laboratory Director

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366)  
LA (85695/04004) OK (211-035)

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Test results relate only to samples analyzed.

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Sample Summary

EarthCon Consultants

Job No: TC20872

Quarterly Well Sampling, Parker County, Texas  
Project No: 3rd Quarter / WW1-Wel

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
TC20872-1	11/30/12	08:40	12/04/12	AQ	Ground Water	WW1-WEL-113012



## SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** EarthCon Consultants

**Job No** TC20872

**Site:** Quarterly Well Sampling, Parker County, Texas

**Report Date** 12/12/2012 12:07:19 P

1 Sample was collected on 11/30/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20872. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### Volatiles by GCMS By Method SW846 8260B

**Matrix** AQ

**Batch ID:** VX1673

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20864-1MS, TC20864-1MSD were used as the QC samples indicated.

### Volatiles by GC By Method RSKSOP-147/175

**Matrix** AQ

**Batch ID:** GSS232

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20890-1DUP, TC20890-1MS were used as the QC samples indicated.
- Matrix Spike Recovery(s) for Ethene, Propane are outside control limits. Probable cause due to matrix interference.
- Matrix Spike Recovery(s) for Ethane, Methane are outside control limits. Outside control limits due to high level in sample relative to spike amount.
- RPD(s) for Duplicate for Butane, Isobutane, Propane are outside control limits for sample TC20890-1DUP.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used

Summary of Hits

**Job Number:** TC20872  
**Account:** EarthCon Consultants  
**Project:** Quarterly Well Sampling, Parker County, Texas  
**Collected:** 11/30/12



Lab Sample ID	Client Sample ID	Result/ Analyte	Qual	MQL	SDL	Units	Method
TC20872-1	WW1-WEL-113012						
		Methane	2.12	0.0050	0.0030	mg/l	RSKSOP-147/175
		Ethane	0.234	0.0010	0.00050	mg/l	RSKSOP-147/175



Sample Results

Report of Analysis

## Report of Analysis

<b>Client Sample ID:</b>	WW1-WEL-113012	<b>Date Sampled:</b>	11/30/12
<b>Lab Sample ID:</b>	TC20872-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	X0087069.D	1	12/06/12	CF	n/a	n/a	VX1673
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

## Purgeable Aromatics

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2	Benzene	0.00034 U	0.0010	0.00034	mg/l	
108-88-3	Toluene	0.00033 U	0.0010	0.00033	mg/l	
100-41-4	Ethylbenzene	0.00032 U	0.0010	0.00032	mg/l	
1330-20-7	Xylene (total)	0.00087 U	0.0030	0.00087	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	105%		72-122%
17060-07-0	1,2-Dichloroethane-D4	97%		68-124%
2037-26-5	Toluene-D8	100%		80-119%
460-00-4	4-Bromofluorobenzene	98%		72-126%

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	WW1-WEL-113012	<b>Date Sampled:</b>	11/30/12
<b>Lab Sample ID:</b>	TC20872-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	RSKSOP-147/175		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	SS005035.D	1	12/06/12	LT	n/a	n/a	GSS232
Run #2	SS005037.D	10	12/06/12	LT	n/a	n/a	GSS232

## RSK147 Special List

CAS No.	Compound	Result	MQL	SDL	Units	Q
74-82-8	Methane	2.12 <sup>a</sup>	0.0050	0.0030	mg/l	
74-85-1	Ethene	0.00050 U	0.0010	0.00050	mg/l	
74-84-0	Ethane	0.234	0.0010	0.00050	mg/l	
74-98-6	Propane	0.00075 U	0.0015	0.00075	mg/l	
75-28-5	Isobutane	0.00075 U	0.0015	0.00075	mg/l	
106-97-8	Butane	0.00075 U	0.0015	0.00075	mg/l	

(a) Result is from Run# 2

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Misc. Forms

5

### Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody
- LRC Form



## CHAIN OF CUSTODY

PAGE 1 OF 1

10165 Harwin Dr, Ste 150 Houston, TX 77036  
TEL 713-271-4700 FAX: 713-271-4770  
www.accutest.com

FED-EX Tracking #		Bottle Order Control #	
Accutest Quote #		Accutest Job # <b>TC20872</b>	
Client / Reporting Information		Project Information	
Company Name <b>EarthCon Consultants, Inc.</b>		Project Name: <b>Third Quarterly Well Sampling, Parker County, Texas</b>	
Street Address <b>4800 Sugar Grove Blvd., Suite 390</b>		Street	
City State Zip <b>Stafford TX 77477</b>		Billing Information (If different from Report to)	
Project Contact <b>Gabriela Floreslovo</b>		Company Name	
Phone # <b>281-201-3513</b>		Street Address	
Fax #		City State Zip	
Sampler(s) Name(s) <b>J.B. Skowitz</b>		Project #	
Phone #		Client Purchase Order #	
Project Manager		Attention:	
Field ID / Point of Collection <b>WW1-WEL-113012</b>		Collection	
Date <b>1/30/12</b>		Time <b>0840</b>	
Sampled By <b>JB</b>		Matrix <b>OW</b>	
# of bottles <b>6</b>		Number of preserved bottles	
PC		NaOH	
Zn/NaOH		HNO3	
H2SO4		H2O2	
NONE		DI Water	
MCH		TSP	
NaHSO4		OTHER	
BTEX 8260B		Butane, Ethane, Ethene, Isobutane, Methane, Propane by RSK-175	
X		X	
LAB USE ONLY			
Turnaround Time (Business days)		Data Deliverable Information	
<input checked="" type="checkbox"/> Standard <input type="checkbox"/> 5 Day RUSH <input type="checkbox"/> 4 Day RUSH <input type="checkbox"/> 3 Day RUSH <input type="checkbox"/> 2 Day RUSH <input type="checkbox"/> 1 Day EMERGENCY Emergency & Rush T/A data available VIA Lablink		Approved By (Accutest PM): / Date: <b>0972 GP</b> <b>12-4-12</b>	
<input type="checkbox"/> Commercial "A" (Level 1) <input type="checkbox"/> Commercial "B" (Level 2) <input type="checkbox"/> FULT1 (Level 3+4) <input type="checkbox"/> REDT1 (Level 3+4) <input type="checkbox"/> Commercial "C"		<input checked="" type="checkbox"/> TRRP <input type="checkbox"/> EDD Format <input type="checkbox"/> Other	
Commercial "A" = Results Only Commercial "B" = Results + QC Summary Commercial "C" = Results + QC & Surrogate Summary		Comments / Special Instructions	
Relinquished by Sampler: <b>John Skowitz</b>		Date Time: <b>12/4/12 1554</b>	
Relinquished by Sampler: <b>3</b>		Received By: <b>2</b>	
Date Time: <b>3</b>		Date Time: <b>2</b>	
Relinquished by: <b>5</b>		Received By: <b>4</b>	
Date Time: <b>5</b>		Date Time: <b>4</b>	
Custody Seal #		<input type="checkbox"/> Intact <input type="checkbox"/> Not Intact	
Preserved where applicable		<input type="checkbox"/> On Ice <input type="checkbox"/> Cooler Temp.	

TC20872: Chain of Custody

Page 1 of 4

**Accutest Job Number:** TC20872      **Client:** EARTHCON CONSULTANTS      **Project:** 3RD QTR WELL SAMPLING,PARKER COUNTY,T  
**Date / Time Received:** 12/4/2012      **Delivery Method:** Client      **Airbill #'s:** \_\_\_\_\_  
**No. Coolers:** 1      **Therm ID:** IR6      **Temp Adjustment Factor:** 0.2  
**Cooler Temps (Initial/Adjusted):** #1: (2.2/2.4)

<b>Cooler Security</b>		<b>Y or N</b>		<b>Y or N</b>	
1. Custody Seals Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>

<b>Cooler Temperature</b>		<b>Y or N</b>
1. Temp criteria achieved:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Cooler temp verification:	Infrared Gun	
3. Cooler media:	Ice (bag)	

<b>Quality Control Preservation</b>	<b>Y or N</b>	<b>N/A</b>	<b>WTB</b>	<b>STB</b>
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Trip Blank listed on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
3. Samples preserved properly:	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
4. VOCs headspace free:	<input checked="" type="checkbox"/>	<input type="checkbox"/>		

<b>Sample Integrity - Documentation</b>	<b>Y or N</b>	
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Container labeling complete:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>	<input type="checkbox"/>

<b>Sample Integrity - Condition</b>	<b>Y or N</b>
1. Sample recvd within HT:	<input checked="" type="checkbox"/> <input type="checkbox"/>
2. All containers accounted for:	<input checked="" type="checkbox"/> <input type="checkbox"/>
3. Condition of sample:	Intact

<b>Sample Integrity - Instructions</b>	<b>Y or N</b>	<b>N/A</b>	
1. Analysis requested is clear:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments -Received trip blank not listed on COC.

**Accutest Job Number:** TC20872

**CSR:** Elessa Sommers

**Response Date:** 12/4/2012

**Response:** Trip blank is on separate report.

5.1

5

**TC20872: Chain of Custody**

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# Sample Receipt Log

**Job #:** TC20872

**Date / Time Received:** 12/4/2012 9:22:00 AM

**Initials:** CH

**Client:** EARTHCON CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	pH	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20872-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20872-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20872-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20872-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20872-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20872-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4

5.1  
5

**TC20872: Chain of Custody**

**Page 4 of 4**



# Appendix A Laboratory Data Package Cover Page

TC20872 This data package consists of

- ☐ This signature page, the laboratory review checklist, and the following reportable data:
- ☐ R1 Field chain-of-custody documentation;
- ☐ R2 Sample identification cross-reference;
- ☐ R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - a) Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
  - b) dilution factors,
  - c) preparation methods,
  - d) cleanup methods, and
  - e) if required for the project, tentatively identified compounds (TICs).
- ☐ R4 Surrogate recovery data including:
  - a) Calculated recovery (%R), and
  - b) The laboratory's surrogate QC limits.
- ☐ R5 Test reports/summary forms for blank samples;
- ☐ R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - a) LCS spiking amounts,
  - b) Calculated %R for each analyte, and
  - c) The laboratory's LCS QC limits.
- ☐ R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - a) Samples associated with the MS/MSD clearly identified,
  - b) MS/MSD spiking amounts,
  - c) Concentration of each MS/MSD analyte measured in the parent and
  - d) Calculated %Rs and relative percent differences (RPDs), and
  - e) The laboratory's MS/MSD QC limits
- ☐ R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - a) The amount of analyte measured in the duplicate,
  - b) The calculated RPD, and
  - c) The laboratory's QC limits for analytical duplicates.
- ☐ R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each
- ☐ R10 Other problems or anomalies.


The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

**Release Statement:** I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Report. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld.

**Check, if applicable:** This laboratory meets an exception under 30 TAC&25.6 and was last inspection by

[ ] [X] TCEQ or [ ] \_\_\_\_\_ on April 2011. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

## QA Manager

Name (Printed)	Signature	Official Title (printed)	Date
Richard Rodriguez		Laboratory Director	12/12/2012
_____	_____	_____	_____

LABORATORY REVIEW CHECKLIST: REPORTABLE DATA									
Laboratory Name:		Accutest Gulf Coast		LRC Date:		12/12/2012			
Project Name:		Quarterly Well Sampling, Parker County, Texas		Laboratory Project Number:		TC20872			
Reviewer Name:		Anita Patel		Prep Batch Number(s):		GSS232, VX1673			
# <sup>1</sup>	A <sup>2</sup>	DESCRIPTION				YES	NO	NA <sup>3</sup>	NR <sup>4</sup> ER # <sup>5</sup>
R1	OI	<b>CHAIN-OF-CUSTODY (C-O-C):</b>							
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?				X			
		Were all departures from standard conditions described in an exception report?				X			
R2	OI	<b>Sample and quality control (QC) identification</b>							
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?				X			
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?				X			
R3	OI	<b>Test reports</b>							
		Were samples prepared and analyzed within holding times?				X			
		Other than those results <MQL, were all other raw values bracketed by calibration standards?				X			
		Were calculations checked by a peer or supervisor?				X			
		Were all analyte identifications checked by a peer or supervisor?				X			
		Were sample detection limits reported for all analytes not detected?				X			
		Were all results for soil and sediment samples reported on a dry weight basis?						X	
		Were % moisture (or solids) reported for all soil and sediment samples?						X	
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?						X	
		If required for the project, are TIC's reported?						X	
R4	O	<b>Surrogate recovery data</b>							
		Were surrogates added prior to extraction?				X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?				X			
R5	OI	<b>Test reports/summary forms for blank samples</b>							
		Were appropriate type(s) of blanks analyzed?				X			
		Were blanks analyzed at the appropriate frequency?				X			
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?				X			
		Were blank concentrations <MQL?				X			
R6	OI	<b>Laboratory control samples (LCS):</b>							
		Were all COCs included in the LCS?				X			
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?				X			
		Were LCSs analyzed at required frequency?				X			
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?				X			
		Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?				X			5
		Was the LCSD RPD within QC limits?						X	
R7	OI	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>							
		Were the project/method specified analytes included in the MS and MSD?				X			
		Were MS/MSD analyzed at the appropriate frequency?				X			
		Were MS (and MSD, if applicable) %Rs within the laboratory QC Limits?					X		4
		Were the MS/MSD RPDs within laboratory QC limits?				X			
R8	OI	<b>Analytical duplicate data</b>							
		Were appropriate analytical duplicates analyzed for each matrix?				X			
		Were analytical duplicates analyzed at the appropriate frequency?				X			
		Were RPDs or relative standard deviations within the laboratory QC limits?					X		4
R9	OI	<b>Method quantitation limits (MQLs):</b>							
		Are the MQLs for each method analyte included in the laboratory data package?				X			
		Do the MQLs correspond to the concentration of the lowest non-zero calibration				X			
		Are unadjusted MQLs and DCs included in the laboratory data package?					X		2
R10	OI	<b>Other problems/anomalies</b>							
		Are all known problems/anomalies/special conditions noted in this LRC and ER?				X			
		Was applicable and available technology used to lower the SDL to minimize the				X			
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package?				X			3

Laboratory Name:		Accutest Gulf Coast	LRC Date:		12/12/2012	
Project Name:		Quarterly Well Sampling, Parker	Laboratory Project Number:		TC20872	
Reviewer Name:		Anita Patel	Prep Batch Number(s):		GSS232, VX1673	
# <sup>1</sup>	A <sup>2</sup>	DESCRIPTION	YES	NO	NA <sup>3</sup>	NR <sup>4</sup> ER # <sup>5</sup>
S1	OI	<b>Initial calibration (ICAL)</b>				
		Were response factors and/or relative response factors for each analyte within QC limits?	X			
		Were percent RSDs or correlation coefficient criteria met?	X			
		Was the number of standards recommended in the method used for all analytes?	X			
		Were all points generated between the lowest and highest standard used to calculate the curve?	X			
		Are ICAL data available for all instruments used?	X			
		Has the initial calibration curve been verified using an appropriate second source standard?	X			
S2	OI	<b>Initial and continuing calibration verification (ICCV AND CCV) and continuing</b>				
		Was the CCV analyzed at the method-required frequency?	X			
		Were percent differences for each analyte within the method-required QC limits?	X			
		Was the ICAL curve verified for each analyte?	X			
		Was the absolute value of the analyte concentration in the inorganic CCB<MDL?			X	
S3	O	<b>Mass spectral tuning</b>				
		Was the appropriate compound for the method used for tuning?	X			
		Were ion abundance data within the method-required QC limits?	X			
S4	O	<b>Internal standards (IS)</b>				
		Were IS area counts and retention times within the method-required QC limits?	X			
S5	OI	<b>Raw data (NELAC Section 5.5.10)</b>				
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X			
		Were data associated with manual integrations flagged on the raw data?	X			
S6	O	<b>Dual column confirmation</b>				
		Did dual column confirmation results meet the method-required QC?			X	
S7	O	<b>Tentatively identified compounds (TICs):</b>				
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X	
S8	I	<b>Interference Check Sample (ICS) results</b>				
		Were percent recoveries within method QC limits?			X	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>				
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X	
S10	OI	<b>Method detection limit (MDL) studies</b>				
		Was a MDL study performed for each reported analyte?	X			
		Is the MDL either adjusted or supported by the analysis of DCSs?	X			5
S11	OI	<b>Proficiency test reports</b>				
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X			
S12	OI	<b>Standards documentation</b>				
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate source?	X			
S13	OI	<b>Compound/analyte identification procedures</b>				
		Are the procedures for compound/analyte identification documented?	X			
S14	OI	<b>Demonstration of analyst competency (DOC)</b>				
		Was DOC conducted consistent with NELAC Chapter 5?	X			
		Is documentation of the analyst's competency up-to-date and on file?	X			
S15	OI	<b>Verification/validation documentation for methods (NELAC Chapter 5)</b>				
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X			
S16	OI	<b>Laboratory standard operating procedures (SOPs)</b>				
		Are laboratory SOPs current and on file for each method performed?	X			

<b>LABORATORY REVIEW CHECKLIST (continued): Exception Reports</b>				
Laboratory Name:		Accutest Gulf Coast	LRC Date:	12/12/2012
Project Name:		Quarterly Well Sampling, Parker	Laboratory Project Number:	TC20872
Reviewer Name:	Anita Patel	Prep Batch Number(s):	GSS232, VX1673	
<b>ER#<sup>1</sup></b>	<b>Description</b>			
1	For reporting purposes, the MQL is defined in the report as the RL. The unadjusted MQL/RL is reported in the method blank. The SDL is defined in the report as the MDL.			
2	For reporting purposes, the method blank represents the unadjusted MQL. The DCS is on file in the laboratory and is not included in the laboratory data package.			
3	The laboratory is NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package for analytes that are listed in the Texas Fields of Accreditation.			
4	All anomalies are discussed in the case narrative.			
5	The laboratory does not perform DCS analysis for Method RSKSOP-147/175. The components reported are not listed or do not have values in the Texas TRRP PCL tables.			

1ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on

## GC/MS Volatiles

### QC Data Summaries

---

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** TC20872

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VX1673-MB	X0087062.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20872-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.34	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l	
108-88-3	Toluene	ND	1.0	0.33	ug/l	
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	105% 72-122%
17060-07-0	1,2-Dichloroethane-D4	95% 68-124%
2037-26-5	Toluene-D8	99% 80-119%
460-00-4	4-Bromofluorobenzene	98% 72-126%

## Blank Spike Summary

Page 1 of 1

**Job Number:** TC20872

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VX1673-BS	X0087060.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20872-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	22.2	89	68-119
100-41-4	Ethylbenzene	25	22.1	88	71-117
108-88-3	Toluene	25	22.4	90	73-119
1330-20-7	Xylene (total)	75	67.7	90	74-119

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	101%	72-122%
17060-07-0	1,2-Dichloroethane-D4	99%	68-124%
2037-26-5	Toluene-D8	101%	80-119%
460-00-4	4-Bromofluorobenzene	92%	72-126%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** TC20872

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20864-1MS	X0087064.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1MSD	X0087065.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1	X0087063.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20872-1

CAS No.	Compound	TC20864-1 ug/l	Spike Q ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	1.0 U	25	23.0	92	22.4	90	3	68-119/12
100-41-4	Ethylbenzene	1.0 U	25	22.7	91	22.4	90	1	71-117/12
108-88-3	Toluene	1.0 U	25	22.9	92	22.5	90	2	73-119/13
1330-20-7	Xylene (total)	3.0 U	75	69.8	93	68.4	91	2	74-119/13

CAS No.	Surrogate Recoveries	MS	MSD	TC20864-1	Limits
1868-53-7	Dibromofluoromethane	103%	101%	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	98%	98%	96%	68-124%
2037-26-5	Toluene-D8	100%	100%	100%	80-119%
460-00-4	4-Bromofluorobenzene	91%	92%	98%	72-126%

\* = Outside of Control Limits.



## GC Volatiles

## QC Data Summaries

---

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** TC20872

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS232-MB	SS005026.D	1	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20872-1

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	ND	0.50	0.30	ug/l	
74-85-1	Ethene	ND	1.0	0.50	ug/l	
74-84-0	Ethane	ND	1.0	0.50	ug/l	
74-98-6	Propane	ND	1.5	0.75	ug/l	
75-28-5	Isobutane	ND	1.5	0.75	ug/l	
106-97-8	Butane	ND	1.5	0.75	ug/l	

## Blank Spike Summary

Page 1 of 1

**Job Number:** TC20872

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS232-BS	SS005023.D	1	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20872-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	21.5	21.0	98	68-139
74-85-1	Ethene	57.4	54.7	95	52-145
74-84-0	Ethane	43.3	56.7	131	68-131
74-98-6	Propane	60.6	68.2	113	69-131
75-28-5	Isobutane	72.5	77.3	107	72-131
106-97-8	Butane	76.6	82.4	108	66-128

\* = Outside of Control Limits.

## Matrix Spike Summary

Page 1 of 1

**Job Number:** TC20872

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20890-1MS	SS005029.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005027.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005030.D	250	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

Method: RKSOP-147/175

TC20872-1

CAS No.	Compound	TC20890-1 ug/l	Spike Q	MS ug/l	MS %	Limits
74-82-8	Methane	20100 <sup>b</sup>	21.5	17100	-13815*	Ø8-139
74-85-1	Ethene	1.0 U	57.4	5540	9654*	52-145
74-84-0	Ethane	3500 <sup>b</sup>	43.3	4120	1431* <sup>a</sup>	68-131
74-98-6	Propane	66.8	60.6	172	174*	69-131
75-28-5	Isobutane	8.41	72.5	93.3	117	72-131
106-97-8	Butane	10.3	76.6	101	119	66-128

(a) Outside control limits due to high level in sample relative to spike amount.

(b) Result is from Run #2.

\* = Outside of Control Limits.

## Duplicate Summary

Page 1 of 1

**Job Number:** TC20872

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20890-1DUP	SS005028.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005027.D	1	12/06/12	LT	n/a	n/a	GSS232
TC20890-1	SS005030.D	250	12/06/12	LT	n/a	n/a	GSS232

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20872-1

CAS No.	Compound	TC20890-1	DUP	Q	RPD	Limits
		ug/l	Q ug/l			
74-82-8	Methane	20100 <sup>a</sup>	16400	E	21	53
74-85-1	Ethene	1.0 U	ND		nc	27
74-84-0	Ethane	3500 <sup>a</sup>	4020	E	14	43
74-98-6	Propane	66.8	99.1		39*	21
75-28-5	Isobutane	8.41	12.1		36*	35
106-97-8	Butane	10.3	15.1		38*	33

(a) Result is from Run #2.

\* = Outside of Control Limits.

Lab #: 321078 Job #: 20030  
 Sample Name/Number: WW1-Wel-113012  
 Company: Oil Tracers, LLC  
 Date Sampled: 11/30/2012  
 Container: Dissolved Gas Bottle  
 Field/Site Name: Third Quarter Well Sampling  
 Location: Parker County, Texas  
 Formation/Depth:  
 Sampling Point:  
 Date Received: 12/05/2012 Date Reported: 2/01/2013

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{18}\text{O}$ ‰
Carbon Monoxide -----	nd			
Hydrogen Sulfide -----	na			
Helium -----	na			
Hydrogen -----	nd			
Argon -----	1.44			
Oxygen -----	0.15			
Nitrogen -----	75.39			
Carbon Dioxide -----	0.33			
Methane -----	21.99	-46.36	-179.5	
Ethane -----	0.701	-21.9		
Ethylene -----	nd			
Propane -----	nd			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	0.0013			
Iso-pentane -----	nd			
N-pentane -----	nd			
Hexanes + -----	nd			

**Remarks:**

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.77

\*Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

\*\* Ethane isotopes obtained online via GC-C-IRMS

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.



12/12/12

## Technical Report for

EarthCon Consultants

Quarterly Well Sampling, Parker County, Texas

3rd Quarter / WW19-Wil

Accutest Job Number: TC20877

Sampling Date: 12/01/12


Report to:

EarthCon Consultants  
4800 Sugar Grove Suite 420  
Stafford, TX 77477  
gfloreslovo@earthcon.com; djackson@jacksonsjoberg.com;  
mcpatton@rangeresources.com; escott@earthcon.com  
ATTN: Gabriela Floreslovo

Total number of pages in report: **26**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Conference and/or state specific certification programs as applicable.

  
Richard Rodriguez  
Laboratory Director

Client Service contact: Elessa Sommers 713-271-4700

Certifications: TX (T104704220-12-8) AR (11-028-0) AZ (AZ0769) FL (E87628) KS (E-10366)  
LA (85695/04004) OK (211-035)

This report shall not be reproduced, except in its entirety, without the written approval of Accutest Laboratories.  
Test results relate only to samples analyzed.

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Sample Summary

EarthCon Consultants

Job No: TC20877

Quarterly Well Sampling, Parker County, Texas  
Project No: 3rd Quarter / WW19-Wil

Sample Number	Collected		Matrix Code	Type	Client Sample ID
	Date	Time By			
TC20877-1	12/01/12	14:05	12/04/12	AQ Ground Water	WW19-WIL-120112

## SAMPLE DELIVERY GROUP CASE NARRATIVE

**Client:** EarthCon Consultants

**Job No** TC20877

**Site:** Quarterly Well Sampling, Parker County, Texas

**Report Date** 12/12/2012 10:29:44 A

1 Sample was collected on 12/01/2012 and received intact at Accutest on 12/04/2012 and properly preserved in 1 cooler at 2.4 Deg C. The sample received an Accutest job number of TC20877. A listing of the Laboratory Sample ID, Client Sample ID and date of collection are presented in the Results Summary Section of this report.

Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

### Volatiles by GCMS By Method SW846 8260B

**Matrix** AQ

**Batch ID:** VX1673

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20864-1MS, TC20864-1MSD were used as the QC samples indicated.

### Volatiles by GC By Method RSKSOP-147/175

**Matrix** AQ

**Batch ID:** GSS233

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) TC20879-1DUP, TC20970-2MS were used as the QC samples indicated.
- Matrix Spike Recovery for Methane is outside control limits. Outside control limits due to high level in sample relative to spike amount.
- TC20970-2MS: Sample was not preserved to a pH < 2.

Accutest Laboratories Gulf Coast (ALGC) certifies that this report meets the project requirements for analytical data produced for the samples as received at ALGC and as stated on the COC. ALGC certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the ALGC Quality Manual except as noted above. This report is to be used in its entirety. ALGC is not responsible for any assumptions of data quality if partial data packages are used

Summary of Hits

**Job Number:** TC20877  
**Account:** EarthCon Consultants  
**Project:** Quarterly Well Sampling, Parker County, Texas  
**Collected:** 12/01/12



Lab Sample ID	Client Sample ID	Result/ Qual	ML	SDL	Units	Method
TC20877-1	WW19-WIL-120112					
Methane		3.54	0.050	0.030	mg/l	RSKSOP-147/175
Ethane		0.439	0.0010	0.00050	mg/l	RSKSOP-147/175

Sample Results

Report of Analysis

## Report of Analysis

<b>Client Sample ID:</b>	WW19-WIL-120112	<b>Date Sampled:</b>	12/01/12
<b>Lab Sample ID:</b>	TC20877-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	SW846 8260B		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	X0087074.D	1	12/06/12	CF	n/a	n/a	VX1673
Run #2							

	Purge Volume
Run #1	5.0 ml
Run #2	

## Purgeable Aromatics

CAS No.	Compound	Result	MQL	SDL	Units	Q
71-43-2	Benzene	0.00034 U	0.0010	0.00034	mg/l	
108-88-3	Toluene	0.00033 U	0.0010	0.00033	mg/l	
100-41-4	Ethylbenzene	0.00032 U	0.0010	0.00032	mg/l	
1330-20-7	Xylene (total)	0.00087 U	0.0030	0.00087	mg/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	106%		72-122%
17060-07-0	1,2-Dichloroethane-D4	97%		68-124%
2037-26-5	Toluene-D8	98%		80-119%
460-00-4	4-Bromofluorobenzene	98%		72-126%

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Report of Analysis

<b>Client Sample ID:</b>	WW19-WIL-120112	<b>Date Sampled:</b>	12/01/12
<b>Lab Sample ID:</b>	TC20877-1	<b>Date Received:</b>	12/04/12
<b>Matrix:</b>	AQ - Ground Water	<b>Percent Solids:</b>	n/a
<b>Method:</b>	RSKSOP-147/175		
<b>Project:</b>	Quarterly Well Sampling, Parker County, Texas		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	SS005057.D	1	12/07/12	LT	n/a	n/a	GSS233
Run #2	SS005058.D	100	12/07/12	LT	n/a	n/a	GSS233

## RSK147 Special List

CAS No.	Compound	Result	MQL	SDL	Units	Q
74-82-8	Methane	3.54 <sup>a</sup>	0.050	0.030	mg/l	
74-85-1	Ethene	0.00050 U	0.0010	0.00050	mg/l	
74-84-0	Ethane	0.439	0.0010	0.00050	mg/l	
74-98-6	Propane	0.00075 U	0.0015	0.00075	mg/l	
75-28-5	Isobutane	0.00075 U	0.0015	0.00075	mg/l	
106-97-8	Butane	0.00075 U	0.0015	0.00075	mg/l	

(a) Result is from Run# 2

U = Not detected      SDL - Sample Detection Limit  
MQL = Method Quantitation Limit  
E = Indicates value exceeds calibration range

J = Indicates an estimated value  
B = Indicates analyte found in associated method blank  
N = Indicates presumptive evidence of a compound

## Misc. Forms

5

### Custody Documents and Other Forms

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Includes the following where applicable:

- Chain of Custody
- LRC Form



## CHAIN OF CUSTODY

PAGE 1 OF 1

10165 Harwin Dr, Ste 150 Houston, TX 77036  
TEL: 713-271-4700 FAX: 713-271-4770  
www.accutest.com

FED-EX Tracking #		Bottle Order Control #	
Accutest Quote #		Accutest Job # <b>TC20877</b>	
Client / Reporting Information		Project Information	
Company Name <b>EarthCon Consultants, Inc.</b>		Project Name <b>Third Quarterly Well Sampling, Parker County, Texas</b>	
Street Address <b>4800 Sugar Grove Blvd., Suite 390</b>		Street	
City <b>Stafford</b>		City	
State <b>TX</b>		State	
Zip <b>77477</b>		Zip	
Project Contact <b>Gabriela Floreslovo</b>		Project #	
E-mail		Street Address	
Phone #		Client Purchase Order #	
Fax #		City	
Sampler(s) Name(s) <b>JB, SH, RM</b>		State	
Phone #		Zip	
Project Manager		Attention:	
Field ID / Point of Collection <b>WW19-W-1-12012</b>		Collection	
Date <b>12/1/12</b>		Time <b>1405</b>	
Sampled By <b>JFB</b>		Matrix <b>GW</b>	
# of bottles <b>6</b>		K	
HCl		NaOH	
ZnAcOH		HNO3	
H2SO4		NONE	
DI Water		MCH	
TSP		NaHSO4	
ENCORE		OTHER	
BTX 0200B		Butane, Ethane, Ethene, Isobutane, Methane, Propane by RSK-175	
Matrix Codes		LAB USE ONLY	
DW - Drinking Water		GW - Ground Water	
WW - Water		SW - Surface Water	
SD - Soil		SL - Sludge	
SED - Sediment		OI - Oil	
LIQ - Other Liquid		AIR - Air	
SOL - Other Solid		WP - Wipe	
FB - Field Blank			
Turnaround Time (Business days)		Data Deliverable Information	
<input checked="" type="checkbox"/> Standard		<input type="checkbox"/> Commercial "A" (Level 1)	
<input type="checkbox"/> 5 Day RUSH		<input type="checkbox"/> Commercial "B" (Level 2)	
<input type="checkbox"/> 4 Day RUSH		<input type="checkbox"/> FULT1 (Level 3+4)	
<input type="checkbox"/> 3 Day RUSH		<input type="checkbox"/> REDT1 (Level 3+4)	
<input type="checkbox"/> 2 Day RUSH		<input type="checkbox"/> Commercial "C"	
<input type="checkbox"/> 1 Day EMERGENCY		<input checked="" type="checkbox"/> TRRP	
Emergency & Rush TIA data available VIA Lablink		<input type="checkbox"/> EDD Format	
Approved By (Accutest PM): / Date:		<input type="checkbox"/> Other	
Commercial "A" = Results Only		Commercial "B" = Results + QC Summary	
Commercial "C" = Results + QC & Surrogate Summary		Comments / Special Instructions	
Relinquished by Sampler: <b>12-4-12 0922</b>		Relinquished By: <b>2</b>	
Date Time: <b>12/4/12 1605</b>		Date Time: <b>2</b>	
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**Accutest Job Number:** TC20877      **Client:** EARTHCON CONSULTANTS      **Project:** 3RD QTR WELL SAMPLING,PARKER COUNTY,T  
**Date / Time Received:** 12/4/2012      **Delivery Method:** Client      **Airbill #'s:** \_\_\_\_\_  
**No. Coolers:** 1      **Therm ID:** IR6      **Temp Adjustment Factor:** 0.2  
**Cooler Temps (Initial/Adjusted):** #1: (2.2/2.4)

<b>Cooler Security</b>		<b>Y or N</b>		<b>Y or N</b>	
1. Custody Seals Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	3. COC Present:	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Custody Seals Intact:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	4. Smpl Dates/Time OK	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>Cooler Temperature</b>		<b>Y or N</b>			
1. Temp criteria achieved:	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
2. Cooler temp verification:	Infrared Gun				
3. Cooler media:	Ice (bag)				
<b>Quality Control Preservation</b>		<b>Y or N</b>	<b>N/A</b>	<b>WTB</b>	<b>STB</b>
1. Trip Blank present / cooler:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Trip Blank listed on COC:	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
3. Samples preserved properly:	<input checked="" type="checkbox"/>	<input type="checkbox"/>			
4. VOCs headspace free:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

<b>Sample Integrity - Documentation</b>		<b>Y or N</b>	
1. Sample labels present on bottles:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Container labeling complete:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Sample container label / COC agree:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
<b>Sample Integrity - Condition</b>		<b>Y or N</b>	
1. Sample recvd within HT:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. All containers accounted for:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
3. Condition of sample:	Intact		
<b>Sample Integrity - Instructions</b>		<b>Y or N</b>	<b>N/A</b>
1. Analysis requested is clear:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
2. Bottles received for unspecified tests	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
3. Sufficient volume recvd for analysis:	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
4. Compositing instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
5. Filtering instructions clear:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Comments - Received trip blank not listed on COC.

**Accutest Job Number:** TC20877

**CSR:** Elessa Sommers

**Response Date:** 12/5/2012

**Response:** Trip blank is on separate report.

5.1

5

**TC20877: Chain of Custody**  
**Page 3 of 4**

## Sample Receipt Log

Page 3 of 3

**Job #:** TC20877

**Date / Time Received:** 12/4/2012 9:22:00 AM

**Initials:** CH

**Client:** EARTHCON CONSULTANTS

Cooler #	Sample ID:	Vol	Bot #	Location	Pres	pH	Therm ID	Initial Temp	Therm CF	Corrected Temp
1	TC20877-1	40ml	1	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20877-1	40ml	2	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20877-1	40ml	3	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20877-1	40ml	4	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20877-1	40ml	5	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4
1	TC20877-1	40ml	6	VR	HCL	Note #1 - Preservative to be checked by analyst at the instrument.	IR6	2.2	0.2	2.4

 5.1  
5

**TC20877: Chain of Custody**
**Page 4 of 4**

# Appendix A Laboratory Data Package Cover Page

TC20877 This data package consists of

- ☐ This signature page, the laboratory review checklist, and the following reportable data:
- ☐ R1 Field chain-of-custody documentation;
- ☐ R2 Sample identification cross-reference;
- ☐ R3 Test reports (analytical data sheets) for each environmental sample that includes:
  - a) Items consistent with NELAC 5.13 or ISO/IEC 17025 Section 5.10
  - b) dilution factors,
  - c) preparation methods,
  - d) cleanup methods, and
  - e) if required for the project, tentatively identified compounds (TICs).
- ☐ R4 Surrogate recovery data including:
  - a) Calculated recovery (%R), and
  - b) The laboratory's surrogate QC limits.
- ☐ R5 Test reports/summary forms for blank samples;
- ☐ R6 Test reports/summary forms for laboratory control samples (LCSs) including:
  - a) LCS spiking amounts,
  - b) Calculated %R for each analyte, and
  - c) The laboratory's LCS QC limits.
- ☐ R7 Test reports for project matrix spike/matrix spike duplicates (MS/MSDs) including:
  - a) Samples associated with the MS/MSD clearly identified,
  - b) MS/MSD spiking amounts,
  - c) Concentration of each MS/MSD analyte measured in the parent and
  - d) Calculated %Rs and relative percent differences (RPDs), and
  - e) The laboratory's MS/MSD QC limits
- ☐ R8 Laboratory analytical duplicate (if applicable) recovery and precision:
  - a) The amount of analyte measured in the duplicate,
  - b) The calculated RPD, and
  - c) The laboratory's QC limits for analytical duplicates.
- ☐ R9 List of method quantitation limits (MQLs) and detectability check sample results for each analyte for each
- ☐ R10 Other problems or anomalies.


The Exception Report for each "No" or "Not Reviewed (NR)" item in Laboratory Review Checklist and for each analyte, matrix, and method for which the laboratory does not hold NELAC accreditation under the Texas Laboratory Accreditation Program.

**Release Statement:** I am responsible for the release of this laboratory data package. This laboratory is NELAC accredited under the Texas Laboratory Accreditation Program for all the methods, analytes, and matrices reported in this data package except as noted in the Exception Report. This data package has been reviewed by the laboratory and is complete and technically compliant with the requirements of the methods used, except where noted by the laboratory in the attached exception reports. By my signature below, I affirm to the best of my knowledge, all problems/anomalies, observed by the laboratory as having the potential to affect the quality of the data, have been identified by the laboratory in the Laboratory Review Checklist, and no information or data have been knowingly withheld.

**Check, if applicable:** This laboratory meets an exception under 30 TAC&25.6 and was last inspection by

[ ] [X] TCEQ or [ ] \_\_\_\_\_ on April 2011. Any findings affecting the data in this laboratory data package are noted in the Exception Reports herein. The official signing the cover page of the report in which these data are used is responsible for releasing this data package and is by signature affirming the above release statement is true.

## QA Manager

Name (Printed)	Signature	Official Title (printed)	Date
Richard Rodriguez		Laboratory Director	12/12/2012
_____			_____

LABORATORY REVIEW CHECKLIST: REPORTABLE DATA									
Laboratory Name:		Accutest Gulf Coast		LRC Date:		12/12/2012			
Project Name:		Quarterly Well Sampling, Parker County, Texas		Laboratory Project Number:		TC20877			
Reviewer Name:		Anita Patel		Prep Batch Number(s):		GSS233, VX1673			
# <sup>1</sup>	A <sup>2</sup>	DESCRIPTION				YES	NO	NA <sup>3</sup>	NR <sup>4</sup> ER # <sup>5</sup>
R1	OI	<b>CHAIN-OF-CUSTODY (C-O-C):</b>							
		Did samples meet the laboratory's standard conditions of sample acceptability upon receipt?				X			
		Were all departures from standard conditions described in an exception report?				X			
R2	OI	<b>Sample and quality control (QC) identification</b>							
		Are all field sample ID numbers cross-referenced to the laboratory ID numbers?				X			
		Are all laboratory ID numbers cross-referenced to the corresponding QC data?				X			
R3	OI	<b>Test reports</b>							
		Were samples prepared and analyzed within holding times?				X			
		Other than those results <MQL, were all other raw values bracketed by calibration standards?				X			
		Were calculations checked by a peer or supervisor?				X			
		Were all analyte identifications checked by a peer or supervisor?				X			
		Were sample detection limits reported for all analytes not detected?				X			
		Were all results for soil and sediment samples reported on a dry weight basis?						X	
		Were % moisture (or solids) reported for all soil and sediment samples?						X	
		Were bulk soils/solids samples for volatile analysis extracted with methanol per SW846 Method 5035?						X	
		If required for the project, are TIC's reported?						X	
R4	O	<b>Surrogate recovery data</b>							
		Were surrogates added prior to extraction?				X			
		Were surrogate percent recoveries in all samples within the laboratory QC limits?				X			
R5	OI	<b>Test reports/summary forms for blank samples</b>							
		Were appropriate type(s) of blanks analyzed?				X			
		Were blanks analyzed at the appropriate frequency?				X			
		Were method blanks taken through the entire analytical process, including preparation and, if applicable, cleanup procedures?				X			
		Were blank concentrations <MQL?				X			
R6	OI	<b>Laboratory control samples (LCS):</b>							
		Were all COCs included in the LCS?				X			
		Was each LCS taken through the entire analytical procedure, including prep and cleanup steps?				X			
		Were LCSs analyzed at required frequency?				X			
		Were LCS (and LCSD, if applicable) %Rs within the laboratory QC limits?				X			
		Does the detectability check sample data document the laboratory's capability to detect the COCs at the MDL used to calculate the SDLs?				X			5
		Was the LCSD RPD within QC limits?						X	
R7	OI	<b>Matrix spike (MS) and matrix spike duplicate (MSD) data</b>							
		Were the project/method specified analytes included in the MS and MSD?				X			
		Were MS/MSD analyzed at the appropriate frequency?				X			
		Were MS (and MSD, if applicable) %Rs within the laboratory QC Limits?					X		4
		Were the MS/MSD RPDs within laboratory QC limits?				X			
R8	OI	<b>Analytical duplicate data</b>							
		Were appropriate analytical duplicates analyzed for each matrix?				X			
		Were analytical duplicates analyzed at the appropriate frequency?				X			
		Were RPDs or relative standard deviations within the laboratory QC limits?				X			
R9	OI	<b>Method quantitation limits (MQLs):</b>							
		Are the MQLs for each method analyte included in the laboratory data package?				X			
		Do the MQLs correspond to the concentration of the lowest non-zero calibration				X			
		Are unadjusted MQLs and DCs included in the laboratory data package?					X		2
R10	OI	<b>Other problems/anomalies</b>							
		Are all known problems/anomalies/special conditions noted in this LRC and ER?				X			
		Was applicable and available technology used to lower the SDL to minimize the				X			
		Is the laboratory NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package?				X			3

Laboratory Name:		Accutest Gulf Coast	LRC Date:		12/12/2012	
Project Name:		Quarterly Well Sampling, Parker	Laboratory Project Number:		TC20877	
Reviewer Name:		Anita Patel	Prep Batch Number(s):		GSS233, VX1673	
# <sup>1</sup>	A <sup>2</sup>	DESCRIPTION	YES	NO	NA <sup>3</sup>	NR <sup>4</sup> ER # <sup>5</sup>
S1	OI	<b>Initial calibration (ICAL)</b>				
		Were response factors and/or relative response factors for each analyte within QC limits?	X			
		Were percent RSDs or correlation coefficient criteria met?	X			
		Was the number of standards recommended in the method used for all analytes?	X			
		Were all points generated between the lowest and highest standard used to calculate the curve?	X			
		Are ICAL data available for all instruments used?	X			
		Has the initial calibration curve been verified using an appropriate second source standard?	X			
S2	OI	<b>Initial and continuing calibration verification (ICCV AND CCV) and continuing</b>				
		Was the CCV analyzed at the method-required frequency?	X			
		Were percent differences for each analyte within the method-required QC limits?	X			
		Was the ICAL curve verified for each analyte?	X			
		Was the absolute value of the analyte concentration in the inorganic CCB<MDL?			X	
S3	O	<b>Mass spectral tuning</b>				
		Was the appropriate compound for the method used for tuning?	X			
		Were ion abundance data within the method-required QC limits?	X			
S4	O	<b>Internal standards (IS)</b>				
		Were IS area counts and retention times within the method-required QC limits?	X			
S5	OI	<b>Raw data (NELAC Section 5.5.10)</b>				
		Were the raw data (for example, chromatograms, spectral data) reviewed by an analyst?	X			
		Were data associated with manual integrations flagged on the raw data?	X			
S6	O	<b>Dual column confirmation</b>				
		Did dual column confirmation results meet the method-required QC?			X	
S7	O	<b>Tentatively identified compounds (TICs):</b>				
		If TICs were requested, were the mass spectra and TIC data subject to appropriate checks?			X	
S8	I	<b>Interference Check Sample (ICS) results</b>				
		Were percent recoveries within method QC limits?			X	
S9	I	<b>Serial dilutions, post digestion spikes, and method of standard additions</b>				
		Were percent differences, recoveries, and the linearity within the QC limits specified in the method?			X	
S10	OI	<b>Method detection limit (MDL) studies</b>				
		Was a MDL study performed for each reported analyte?	X			
		Is the MDL either adjusted or supported by the analysis of DCSs?	X			5
S11	OI	<b>Proficiency test reports</b>				
		Was the laboratory's performance acceptable on the applicable proficiency tests or evaluation studies?	X			
S12	OI	<b>Standards documentation</b>				
		Are all standards used in the analyses NIST-traceable or obtained from other appropriate source?	X			
S13	OI	<b>Compound/analyte identification procedures</b>				
		Are the procedures for compound/analyte identification documented?	X			
S14	OI	<b>Demonstration of analyst competency (DOC)</b>				
		Was DOC conducted consistent with NELAC Chapter 5?	X			
		Is documentation of the analyst's competency up-to-date and on file?	X			
S15	OI	<b>Verification/validation documentation for methods (NELAC Chapter 5)</b>				
		Are all the methods used to generate the data documented, verified, and validated, where applicable?	X			
S16	OI	<b>Laboratory standard operating procedures (SOPs)</b>				
		Are laboratory SOPs current and on file for each method performed?	X			

LABORATORY REVIEW CHECKLIST (continued): Exception Reports			
Laboratory Name:	Accutest Gulf Coast	LRC Date:	12/12/2012
Project Name:	Quarterly Well Sampling, Parker	Laboratory Project Number:	TC20877
Reviewer Name:	Anita Patel	Prep Batch Number(s):	GSS233, VX1673
ER# <sup>1</sup>	Description		
1	For reporting purposes, the MQL is defined in the report as the RL. The unadjusted MQL/RL is reported in the method blank. The SDL is defined in the report as the MDL.		
2	For reporting purposes, the method blank represents the unadjusted MQL. The DCS is on file in the laboratory and is not included in the laboratory data package.		
3	The laboratory is NELAC-accredited under the Texas Laboratory Accreditation Program for the analytes, matrices, and methods associated with this laboratory data package for analytes that are listed in the Texas Fields of Accreditation.		
4	All anomalies are discussed in the case narrative.		
5	The laboratory does not perform DCS analysis for Method RSKSOP-147/175. The components reported are not listed or do not have values in the Texas TRRP PCL tables.		

1ER# = Exception Report identification number (an Exception Report should be completed for an item if "NR" or "No" is checked on

## GC/MS Volatiles

## QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries



## Method Blank Summary

Page 1 of 1

**Job Number:** TC20877

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VX1673-MB	X0087062.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20877-1

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.34	ug/l	
100-41-4	Ethylbenzene	ND	1.0	0.32	ug/l	
108-88-3	Toluene	ND	1.0	0.33	ug/l	
1330-20-7	Xylene (total)	ND	3.0	0.87	ug/l	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	105% 72-122%
17060-07-0	1,2-Dichloroethane-D4	95% 68-124%
2037-26-5	Toluene-D8	99% 80-119%
460-00-4	4-Bromofluorobenzene	98% 72-126%

## Blank Spike Summary

Page 1 of 1

**Job Number:** TC20877

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
VX1673-BS	X0087060.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20877-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
71-43-2	Benzene	25	22.2	89	68-119
100-41-4	Ethylbenzene	25	22.1	88	71-117
108-88-3	Toluene	25	22.4	90	73-119
1330-20-7	Xylene (total)	75	67.7	90	74-119

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	101%	72-122%
17060-07-0	1,2-Dichloroethane-D4	99%	68-124%
2037-26-5	Toluene-D8	101%	80-119%
460-00-4	4-Bromofluorobenzene	92%	72-126%

\* = Outside of Control Limits.

# Matrix Spike/Matrix Spike Duplicate Summary

Page 1 of 1

**Job Number:** TC20877

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20864-1MS	X0087064.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1MSD	X0087065.D	1	12/06/12	CF	n/a	n/a	VX1673
TC20864-1	X0087063.D	1	12/06/12	CF	n/a	n/a	VX1673

The QC reported here applies to the following samples:

Method: SW846 8260B

TC20877-1

CAS No.	Compound	TC20864-1		Spike ug/l	MS ug/l	MS %	MSD ug/l	MSD %	RPD	Limits Rec/RPD
		ug/l	Q							
71-43-2	Benzene	1.0	U	25	23.0	92	22.4	90	3	68-119/12
100-41-4	Ethylbenzene	1.0	U	25	22.7	91	22.4	90	1	71-117/12
108-88-3	Toluene	1.0	U	25	22.9	92	22.5	90	2	73-119/13
1330-20-7	Xylene (total)	3.0	U	75	69.8	93	68.4	91	2	74-119/13

CAS No.	Surrogate Recoveries	MS	MSD	TC20864-1	Limits
1868-53-7	Dibromofluoromethane	103%	101%	105%	72-122%
17060-07-0	1,2-Dichloroethane-D4	98%	98%	96%	68-124%
2037-26-5	Toluene-D8	100%	100%	100%	80-119%
460-00-4	4-Bromofluorobenzene	91%	92%	98%	72-126%

\* = Outside of Control Limits.

## GC Volatiles

## QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries

## Method Blank Summary

Page 1 of 1

**Job Number:** TC20877

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS233-MB	SS005056.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20877-1

CAS No.	Compound	Result	RL	MDL	Units	Q
74-82-8	Methane	ND	0.50	0.30	ug/l	
74-85-1	Ethene	ND	1.0	0.50	ug/l	
74-84-0	Ethane	ND	1.0	0.50	ug/l	
74-98-6	Propane	ND	1.5	0.75	ug/l	
75-28-5	Isobutane	ND	1.5	0.75	ug/l	
106-97-8	Butane	ND	1.5	0.75	ug/l	

## Blank Spike Summary

Page 1 of 1

**Job Number:** TC20877

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GSS233-BS	SS005054.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20877-1

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
74-82-8	Methane	21.5	16.2	75	68-139
74-85-1	Ethene	57.4	43.2	75	52-145
74-84-0	Ethane	43.3	47.1	109	68-131
74-98-6	Propane	60.6	60.5	100	69-131
75-28-5	Isobutane	72.5	70.4	97	72-131
106-97-8	Butane	76.6	73.6	96	66-128

\* = Outside of Control Limits.

## Matrix Spike Summary

Page 1 of 1

**Job Number:** TC20877

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20970-2MS <sup>a</sup>	SS005067.D	1	12/07/12	LT	n/a	n/a	GSS233
TC20970-2 <sup>a</sup>	SS005066.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20877-1

CAS No.	Compound	TC20970-2 ug/l	Spike Q ug/l	MS ug/l	MS %	Limits
74-82-8	Methane	105	21.5	95.8	-42* <sup>b</sup>	68-139
74-85-1	Ethene	ND	57.4	46.6	81	52-145
74-84-0	Ethane	4.71	43.3	46.7	97	68-131
74-98-6	Propane	ND	60.6	53.4	88	69-131
75-28-5	Isobutane	ND	72.5	61.8	85	72-131
106-97-8	Butane	ND	76.6	66.0	86	66-128

(a) Sample was not preserved to a pH < 2.

(b) Outside control limits due to high level in sample relative to spike amount.

\* = Outside of Control Limits.

## Duplicate Summary

Page 1 of 1

**Job Number:** TC20877

**Account:** PESTXST EarthCon Consultants

**Project:** Quarterly Well Sampling, Parker County, Texas

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
TC20879-1DUP	SS005062.D	1	12/07/12	LT	n/a	n/a	GSS233
TC20879-1	SS005061.D	1	12/07/12	LT	n/a	n/a	GSS233

The QC reported here applies to the following samples:

Method: RSKSOP-147/175

TC20877-1

CAS No.	Compound	TC20879-1	DUP	Q	RPD	Limits
		ug/l	Q ug/l			
74-82-8	Methane	4.10	3.34		20	53
74-85-1	Ethene	1.0 U	ND		nc	27
74-84-0	Ethane	1.0 U	ND		nc	43
74-98-6	Propane	1.5 U	ND		nc	21
75-28-5	Isobutane	1.5 U	ND		nc	35
106-97-8	Butane	1.5 U	ND		nc	33

\* = Outside of Control Limits.



Lab #: 321085 Job #: 20030  
 Sample Name/Number: WW19-Wil-120112  
 Company: Oil Tracers, LLC  
 Date Sampled: 12/01/2012  
 Container: Dissolved Gas Bottle  
 Field/Site Name: Third Quarter Well Sampling  
 Location: Parker County, Texas  
 Formation/Depth:  
 Sampling Point:  
 Date Received: 12/05/2012 Date Reported: 2/01/2013

Component	Chemical mol. %	$\delta^{13}\text{C}$ ‰	$\delta\text{D}$ ‰	$\delta^{18}\text{O}$ ‰
Carbon Monoxide -----	nd			
Hydrogen Sulfide -----	na			
Helium -----	na			
Hydrogen -----	nd			
Argon -----	1.21			
Oxygen -----	0.10			
Nitrogen -----	64.28			
Carbon Dioxide -----	0.21			
Methane -----	33.17	-43.95	-155.6	
Ethane -----	1.03	-22.35		
Ethylene -----	nd			
Propane -----	0.0007			
Propylene -----	nd			
Iso-butane -----	nd			
N-butane -----	0.0007			
Iso-pentane -----	0.0007			
N-pentane -----	nd			
Hexanes + -----	nd			

**Remarks:**

Analysis is of gas extracted from water by headspace equilibration. Analysis has been corrected for helium added to create headspace. Helium dilution factor = 0.72

\*Addition of helium negates the ability to detect native helium and may negate the ability to detect hydrogen.

nd = not detected. na = not analyzed. Isotopic composition of hydrogen is relative to VSMOW. Isotopic composition of carbon is relative to VPDB. Isotopic composition of oxygen is relative to VSMOW, except for carbon dioxide which is relative to VPDB. Calculations for BTU and specific gravity per ASTM D3588. Chemical compositions are normalized to 100%. Mol. % is approximately equal to vol. %.